MARINE REVIEW.

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Hammering Down the Price of Ships.

Now it is the ship builders who are talking of John D. Rockefeller and the probable effect on their industry produced by his operations on the lakes. During the past three or four weeks, General Manager L. M. Bowers of the Bessemer Steamship Co. has been constantly engaged in correspondence or personal interviews with the managers of ship yards. Nearly all of them have submitted plans and prices to him, and most of them have spent hours in his office, and yet they are in the dark as to whether he will order one ship, ten ships or none at all. They are agreed in saying, however, that if he had prices to suit him he would undoubtedly fill up all idle berths in the lake yards, and accept delivery late next summer on some of the vessels. On this score Mr. Bowers says nothing, but it is plain that the advantage which he possesses as the representative of a great money interest is bringing to him just what he wants, a full knowledge of the cost of building ships. He is even getting a knowledge, through these negotiations, of any advantage which one ship yard may possess over another in the way of labor cost, freight on material and other items entering into the question of competition in the business. There is no secret as to his operations in this regard, which from present indications have undoubtedly been going on for several months past.

The ship builders, who realize the power of one man with unlimited capital dealing with them on a big scale as against their negotiations in the past with numerous vessel owners around the lakes, are of course trying to cope with the desire to secure work and at the same time maintain prices as best they can. If their yards were idle, Mr. Rockefeller's representative might have an easier task, but the situation is somewhat against him in this regard. His action in giving F. W. Wheeler & Co. an order for three big vessels at the outset is taken as a shrewd move to lower prices. Circumstances connected with the building of the first fleet of Bessemer ships prompted peculiar relations with Wheeler & Co., and the ship builders claim that from an insight of the business gained through these relations the managers of the Bessemer company is expecting too much in the way of reduced prices. However this may be, it would seem that he has scored an important point in the prices to be paid for the three ships to be built by Wheeler & Co. Prices submitted by other builders on these vessels are proof that the figures on which the contracts were let are very low. The exact figures are probably known only to parties of the contract, but it is reported among the builders that the steamer is to be built for about $249,000 and the schooners for a little less than $150,000 each. The effect of such prices on the ship building industry, even though they may be several thousand dollars below the right mark, may be understood when it is known that as high as $258,000 was paid for some of the original steamers of the Bessemer fleet, notwithstanding the great difference in their capacity as compared with the 475-foot steamer of today, and notwithstanding also the very shrewd manner in which agents of Mr. Rockefeller caused the ship builders to think they were bidding against each other when the first vessels of the fleet were ordered. These are some of the reasons that are now causing the ship builders to study in their turn with the vessel owners the effect of Rockefeller operations on their business.

Immense Soft Coal Movement.

It is probable that soft coal shipments from Ohio ports during the present month will exceed by 50 per cent. the shipments of any other month in the history of the lake commerce. Railway managers are doing all in their power to help the coal dealers make up for time lost during the strike. They are limiting the number of cars to be furnished for ore business, and the scarcity of ore cargoes is due in part to this action. Quite a large number of the biggest carriers have of late been taking coal cargoes, and this extra tonnage has been of great assistance to the coal shippers in preventing marked advances in freights. The shippers themselves have worked together very well in holding rates down. They figure that all of the vessels that will take up cargoes under any circumstances will load coal at present rates, and on this account they argue that there is nothing to be gained in bidding against the hard coal shippers of Buffalo. Their policy is to follow rather than lead Buffalo in the matter of rates, as they say that Buffalo shippers will not allow any tonnage which they need to be taken away from that port on account of an attempt at Ohio ports to bid against them.

Rockefeller ships will fall a little short of moving 1,500,000 tons of ore this season. That mark would have been reached but for some hesitancy in sending the vessels out in the spring, and, but for detention of late in the ore trade, due to the rush of coal shipments over Ohio and Pennsylvania railways leading to Lake Erie. Including the three ships ordered from F. W. Wheeler & Co., the aggregate investment in Rockefeller vessels on the lakes is nearly $4,000,000. Quadruple expansion engines of the steamer to be built by Wheeler & Co., will develop 2,700 horse power. This is big power for the slow-going kind of ship that is required in the carrying trade of the lakes. The cost of this vessel's machinery and boilers will probably exceed $75,000.

Luce's "Seamanship" has been a text-book at the United States naval academy for the past thirty years. It is being used by naval reserve organizations all over the country. It is a standard work, selling at $10, and will be mailed to any address at that figure by the Marine Review, 409 Perry-Payne building, Cleveland.

Everybody Talks of John D. Rockefeller.

John D. Rockefeller, Jr., twenty-three years of age, has just visited, in company with Mr. F. T. Gates, the iron mining districts at the head of Lake Superior, where his father is heavily interested in profitable mines, in a valuable railway, in ore docks, in a ship yard and in large tracts of undeveloped mining property. He is to be initiated into the lake business —probably not the details but the more important responsibilities. He is regarded by everybody who knows him as a promising young man. He is energetic but unassuming. His initial business training, from all that can be learned, will be with Mr. Gates and will have to do with the extensive interests which his father has acquired of late in iron mines and in the transportation of ore on the lakes. This is the conclusion from the fact that he is now being taken over the ground to judge of and become acquainted with these interests for himself. Some of them, it is needless to say, will strike him as regular Klondykes from a dividend-earning standpoint, whatever his ideas may be of profits in the business world. But after all, there are men of business who will pity him; pity him for the reason that if he is to undertake real business cares, even to the extent of his father's present interests on the lakes, the responsibilities before him are great. He is already the subject of gossip. A popular argument is that not one in a thousand among the sons of wealthy men prove equal to the opportunities offered them. It is declared also that when John D. Rockefeller gives up reins of business a process of disintegration will occur in the big corporations which he has built up.

But the fact remains that the young Mr. Rockefeller will have good tutors, not least among whom is F. T. Gates, who has been showing him around the mines of Lake Superior. In this connection it may be of interest to note a peculiarity in the man who has been so much talked about of late on the lakes, and who is said to draw a salary of $30,000 a year as one of Mr. Rockefeller's first lieutenants. A leading ore shipper of Cleveland, who is probably as well informed of Rockefeller affairs as anyone can be outside of the circle of management, was discussing the changes that have taken place in the iron industry since the first announcement was made of a connection between the Rockefeller and Carnegie interests in the mining and transportation of ore. "It is of course well understood," he said, "that the contracts made by these interests were so far-reaching in their effects that everybody began to talk of Gates, and when he appeared later at a meeting of ore dealers in Cleveland he was the center of attraction. This was the meeting which it was thought would be the funeral of the ore pool, but at which the Rockefeller interest took a stand in favor of a pool that was entirely contrary to what was looked for. Everybody expected to hear from Mr. Gates at the outset, but several others had their say before he spoke. It was remarked that when he began to talk he turned his back to everybody in the room, and with his eyes fixed on a spot in the ceiling he continued for probably five minutes, never turning to see whether anybody was listening to him or not. Of course they were all listening to him without a sound of interruption. When it was necessary to speak again, his eyes were turned to another corner of the room, and everybody wondered why he did it. Probably it was only a habit and one that would not be remarked in a man occupying a less prominent position."

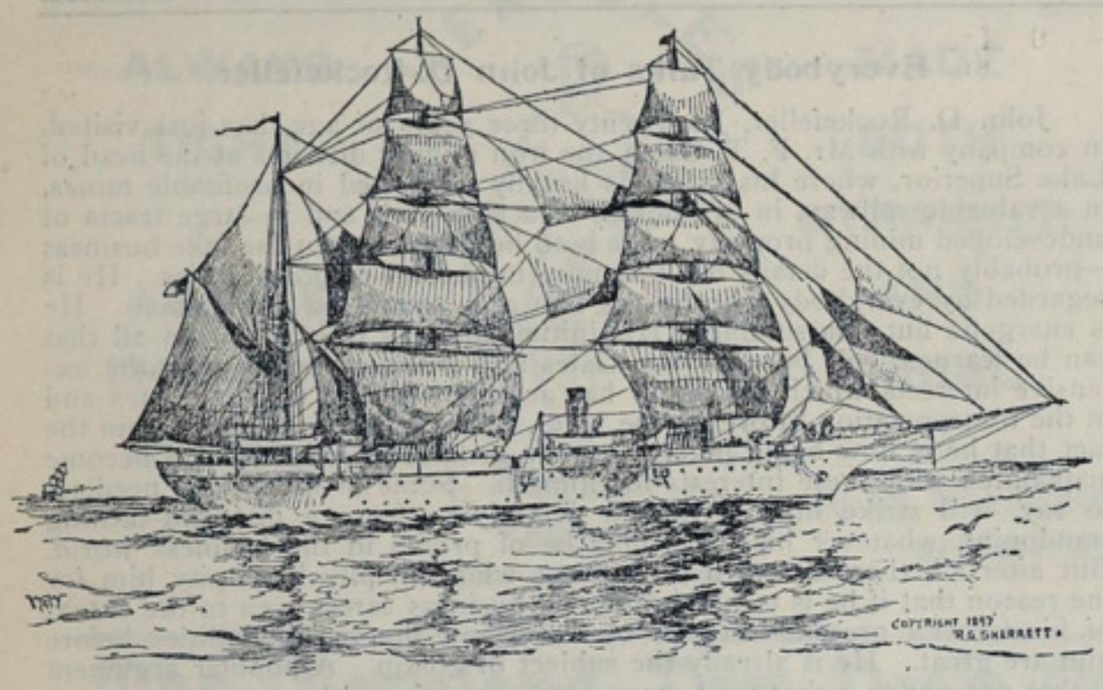
"Previous to this meeting, F. T. Gates was not very well known on the lakes. His dealings were with only a few representative men in the iron industry, and they were conducted very quietly, both here and in Minnesota. But of late his operations in the interest of Mr. Rockefeller have of necessity been more public. It would seem that his policy, as indicated by contracts made with the Carnegie-Oliver combination, is not to seek profit from the ownership of ore under ground in the Lake Superior region, but rather to develop the property and hold the valuable right of transportation in everything that touches the interest which he represents. It should be plain, then, to the intelligent vessel owner that low cost of transportation affording profit only in a great volume of business, is the problem that now faces him. A similar condition is presented in the iron and steel industry. Mr. Rockefeller's representatives are planning the building of ships and the operation of them on a scale equal to their interests in mining property, and in fact equal to all that the iron industry will support. If the business is to be enlarged by exports of iron and steel later on, they will be in position to reap great advantages from the foreign trade. They know, for instance, how many vessels there are on the lakes that can move ore from the head of Lake Superior to Ohio ports at 60 cents a ton and meet all expenses. The number is small, but it includes their fleet. They are building vessels of this class and many of them. No great forethought is required to judge of the results."

The Detroit Free Press complains of the neglect of the Lake Carriers' Association regarding the memorial which it was proposed to erect at Sault Ste. Marie in honor of the late Gen. Poe. Better consult a Detroit vessel man on the subject. Gen. Russel A. Alger, now secretary of war, was the moving spirit in this matter when it was first suggested. It would seem that in his present position the honorable secretary of war could exert a special influence in behalf of any plan for perpetuating the memory of Gen. Poe at Sault Ste. Marie.

In addition to the options on the Pioneer mine which the Oliver Mining Co. has had for some time past, it is understood that one of the Cleveland-Cliffs Iron Co.'s mines at Ishpeming was looked over and negotiations started with a view to purchase. No agreement was reached, however, and it is not likely that the Pittsburg interests will make any futher move for the present to enter the Marquette range.—Iron Trade Review.

New Training Ship.

The last congress appropriated $125,000 for the construction of a modern training ship for the use of cadets at the United States Naval Academy. Upon the completion of plans for the vessel, the navy department realized, however, that this sum was not sufficient, and it will therefore ask for bids for not only a partial construction of the ship, relying upon congress to provide later the additional sum needed for its completion. The new vessel will be built of steel and sheathed with wood and coppered. Her principal dimensions will be: Length on water line, 175



NEW TRAINING SHIP FOR THE NAVY.

feet; maximum beam at water line, 37 feet; draught forward, 15 feet 6 inches; draught aft, 17 feet 6 inches; draught, mean, 16 feet 6 inches; displacement at mean draught, 1,100 tons. The ship will carry no bowsprit, in the usual sense of the word, the stem being run up and out to the point where the bowsprit cap would be the bulwark plating rounding over and forming a sleeve for the jibboom. There will be accommodations for a captain, ten wardroom officers, two warrant officers, 180 cadets and a working corps of ninety blue-jackets. The drawing for the accompanying engraving was made by R. G. Skerrett of the bureau of construction and repair, navy department, and the Review is indebted to the New York Herald for permission to reproduce it.

Naval Architects and Marine Engineers.

Secretary Francis T. Bowles of the Society of Naval Architects and Marine Engineers announces that the fifth general meeting of the society will take place in New York city, at 10.00 a. m. Thursday, Nov. 11. Through the courtesy of the president and managers of the American Society of Mechanical Engineers, the meetings will be held in the auditorium of No. 12 West Thirty-First street, the sessions continuing through Thursday and Friday, Nov. 11 and 12. There will be a banquet at Delmonico's, at 7 p. m., Friday, Nov. 12, to which members and their guests are invited. Members intending to propose candidates for membership are requested to notify the secretary, in order that the necessary blank forms of application may be forwarded and properly filled out. The list of the papers to be read is as follows:

THURSDAY, NOV. 11, 1897.

Watertight Bulkhead Doors—The "Long-Arm" System on the U. S. S. Chicago. By Wm. Barnum Cowles, Esq., member.

Regulations for Loading Vessels. By Lewis Nixon, Esq., member.

Torpedo Boat Design. By Ass't Naval Constructor H. G. Gillmor, U. S. Navy, associate.

The Commerce of the Great Lakes. By C. E. Wheeler, Esq., member.

Progressive Trials of the Guardian. By Prof. C. H. Peabody, member.

An Experimental Study of the Influence of Surface upon the Performance of Screw Propellers. Preliminary paper. By Prof. W. F. Durand, member.

FRIDAY, NOV. 12, 1897.

Some Notes on the Speed Trials and Experience in Commission of our New Battleships. By Chief Constructor Philip Hichborn, U. S. Navy, vice-president.

Performance of Scotch Boilers and their Durability under Forced Draught. By Edwin S. Cramp, Esq., member.

Use of Water Ballast for Colliers in the Pacific Coast Trade. By Wm. P. Frear, Esq., member.

Estimated Weights of Machinery. By Prof. Geo. R. McDermott, member.

Navy Yard Expenses. By Naval Constructor W. J. Baxter, U. S. Navy, member.

Pneumatic Steering Gear as Applied to the U. S. Monitor Terror. By H. A. Spiller, Esq., member.

"We have a letter from Mr. Howden," says Gilbert N. McMillan of the Detroit Dry Dock Co., "stating that the Howden hot draft is now installed in vessels throughout the world of 1,550,900 indicated horse power. The North German Lloyd steamer Kaiser Wilhelm der Grosse is equipped with this draft, as is also the Empress Queen, which is the most powerful side-wheel steamer in the world, and which is in service between Liverpool and the Isle of Man."

The Alexander Smith & Sons Carpet Co., of Yonkers, N. Y., has placed the contract for the fire-proof dye houses with the Berlin Iron Bridge Co., of East Berlin, Conn. These busilding are to be 50 feet wide and 100 feet long and to be built entirely of steel.

The Chicago Pneumatic Tool Co. has opened an office in New York at No. 122 Liberty street, Beard building, rooms Nos. 1005-6.

Field Operations on the Ship-Canal Project.

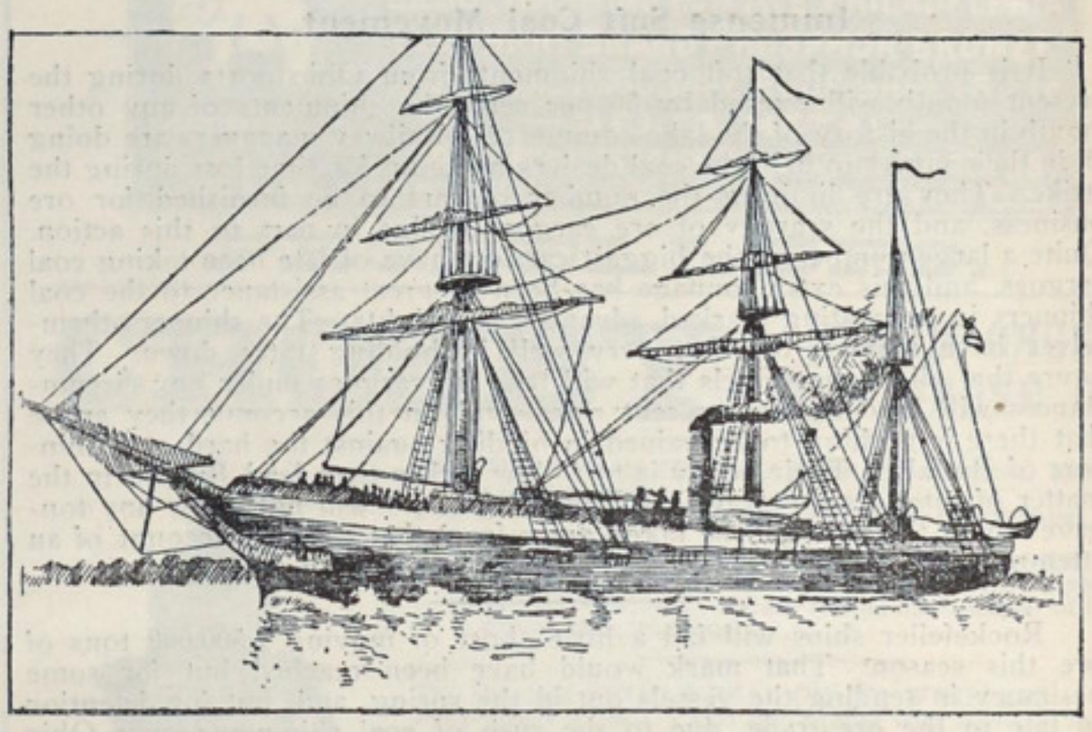
Now that the board of engineers appointed by President McKinley to make surveys for the proposed Great Lakes-Atlantic ship-canal has engaged a large force of assistants for field work, it is quite probable that numerous rumors will be circulated of routes decided upon by the engineers. But little attention will be paid to these rumors when the extent of field operations and other duties of the new commission are understood. The act of congress providing for this work enacts that the board of engineers shall make surveys and examinations of deep waterways and routes thereof between the great lakes and Atlantic tide waters, as recommended by the report of the Deep Waterways Commission transmitted by the president to congress June 18, 1897. This report recommends that surveys and examinations be made sufficient for devising plans and estimating cost for regulating the level of Lake Erie, for developing the Niagara ship-canal, for developing the Oswego-Oneida-Mohawk route, for developing the St. Lawrence Champlain route, and for improving the channel of the Hudson river. The law, therefore, fixes certain work which must be done, and it is the policy of the board of engineers to take up and complete this work first, and at the same time make a careful study of other routes which have been advocated as worthy of investigation. The fact that surveys of certain routes have been commenced is by no means to be considered an indication that they will be recommended as worthy of improvement. The main object of the investigation is to determine whether the various routes can be opened at a cost which would be less than the value of the benefit to be derived by commerce, and if so, which will be the preferable and most economical route to improve.

Four parties have been organized for carrying out the surveys and examinations as outlined above. The development of plans for the regulation of the lake level requires an accurate knowledge of the volume of flow through the lake outlets. Mr. E. E. Haskel, an engineer of national reputation, is now at Buffalo making observations for determining the discharge of the Niagara river. It is expected that this work will be continued next year on all the connecting channels of the lakes by the officers of the United States engineer corps. The services of Mr. Chas. L. Harrison, of Chicago, have been secured for making survey of the proposed route from Lake Erie to Lake Ontario. Mr. Harrison has had wide experience in making investigations of this nature, and for the past five years has had charge of one of the most important sections of the Chicago drainage canal. Mr. Albert J. Himes, who has charge of the party at Oswego, is one of the best equipped engineers in the country for the kind of work required, and for the past four years has been the resident engineer for the eastern division of the Erie canal. Mr. D. J. Howell, of Washington, D. C., is organizing a party at Troy, N. Y., to make survey of the Mohawk river. Mr. Howell has had large experience in making surveys of railroads and towns, and topographical surveys for the geological department, and is well qualified for making a success of the investigations which have been assigned to him.

These surveys will be continued as late into the winter as the weather will admit of making satisfactory progress. An office has been opened by the board at No. 34 Congress street, Detroit, where the members, when not supervising field work, will make a careful study of the data as fast as collected and devise plans on which to base estimates of cost of the different proposed routes under examination.

Michigan's Saucy Ship

A Boston correspondent writes that the U. S. S. Yantic, when leaving the Charlestown navy yard for the lakes, was the sauciest and most beautiful of the smaller ships of Uncle Sam's navy. "The inland blue jackets can be congratulated," he adds, "on having the finest craft of all the naval vessels yet assigned to any state's naval reserve, according to the opinion of the officials and shipwrights at the Charlestown navy yard, for the little brig has been thoroughly repaired from keelson to truck. New spars, a complete new set of sails, new arrangements more suitable to the



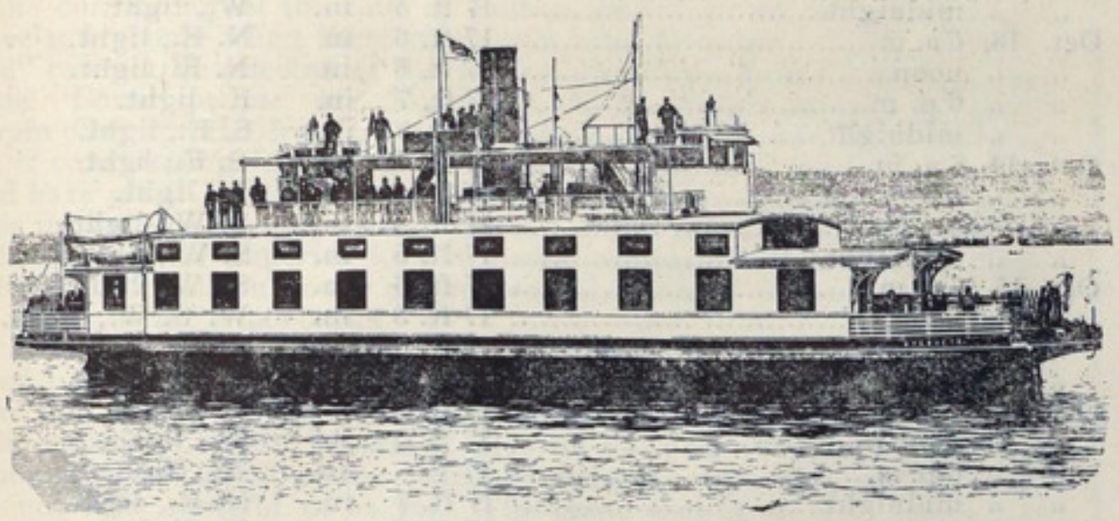
THE YANTIC—MICHIGAN'S NAVAL RESERVE SHIP.

requirements of a reserve brigade, in fact, everything that would have been done to have made the craft thoroughly ship-shape and fit to go again into active naval service has been done the past month or more. On leaving here for Montreal the Yantic was pronounced the equal, if not the superior, of any wooden ship owned by the navy department."

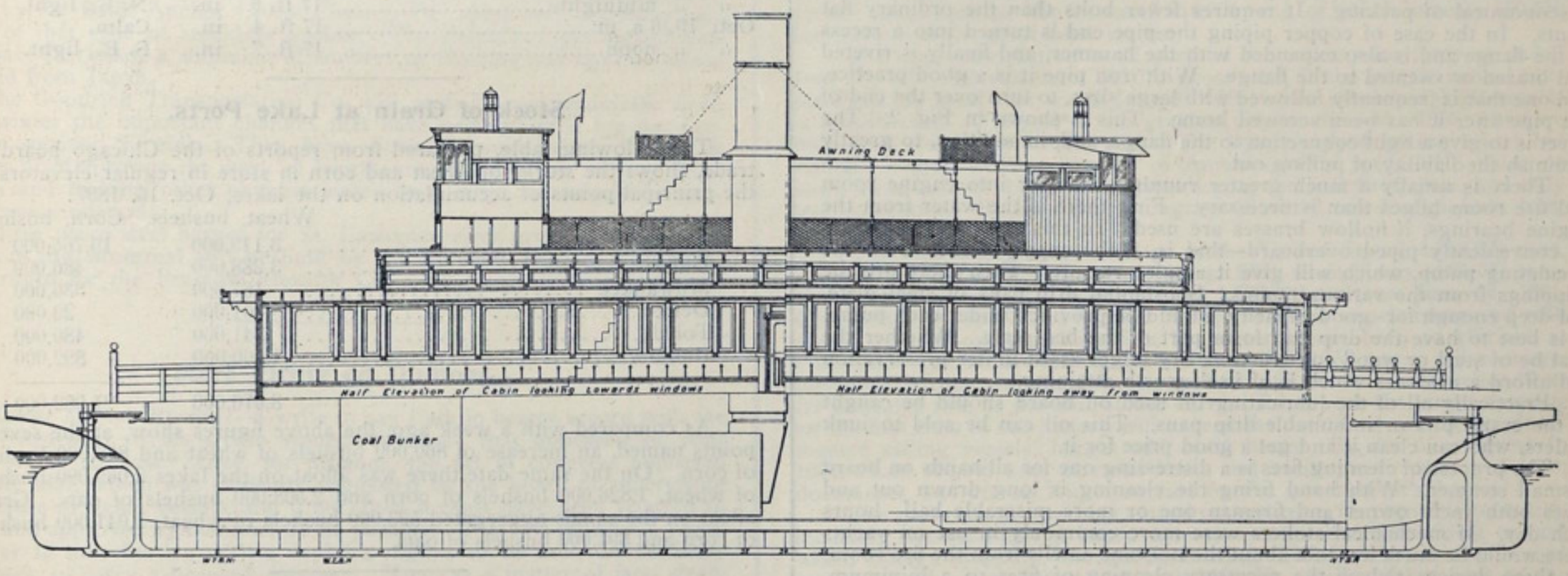
Mr. F. W. Wheeler, West Bay City ship builder, who is now on his way to Montreal aboard the tug Wilmot, built at his ship yard for R. W. Wilmot of New Orleans, will look after the work of bringing the Yantic to the lakes through the St. Lawrence river and the Canadian canals of that river.

Canadian Ferry Steamer Chebucto.

The ferry steamer illustrated in three engravings on this page is intended for service between Dartmouth and Halifax, Nova Soctia, a distance of some eight miles. At last accounts, she was somewhere among the Azores, having met with accident in a storm on the Atlantic while

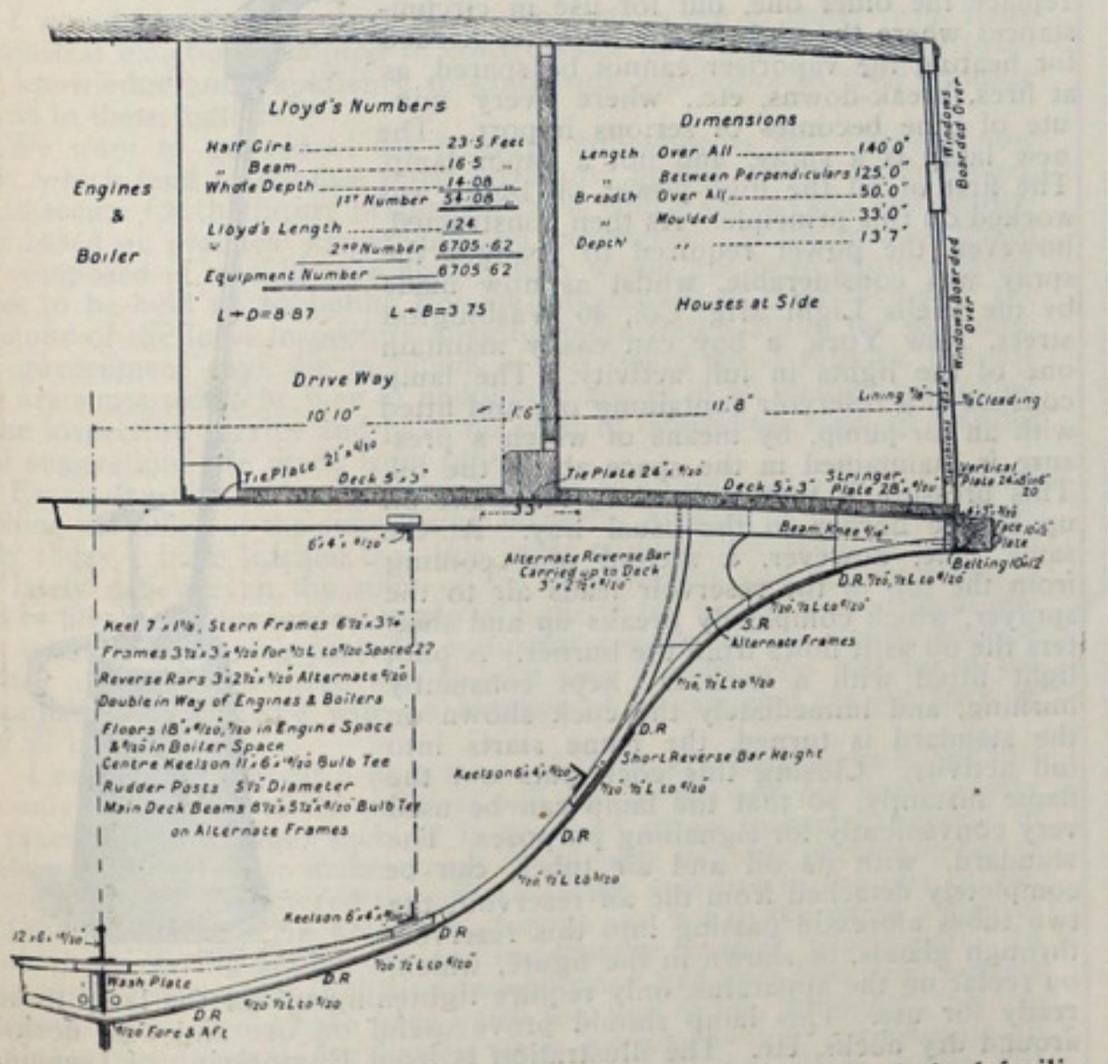


her builders, a Clyde firm, were trying to deliver her at Dartmouth. It seems strange that the people of Nova Scotia went to Scotland for such a vessel, as she is representative of a kind of ferry that is not uncommon


Awning Deck
Half Elevation of Cabin looking towards windows
Half Elevation of Cabin looking away from windows
Coal Bunker

Longitudinal Elevation of Ferry Steamer Chebucto.

in this country or Canada, but was regarded as a novelty where she was built. Clyde ship builders could not, of course, compete for the construction of such a vessel if she was intended for service in the United



States. It would seem, also, that notwithstanding Canada's limited facilities for ship building, this vessel could have been built at home, but the staid old people of Dartmouth and Halifax were greatly pleased with

ferry engines that were built for them years ago in Scotland, and they went back to the Clyde when they had another ferry to build. Now there is considerable difficulty in bringing the craft across the Atlantic.

The builders are John Shearer & Sons of Glasgow, and the vessel is 140 feet over all, 50 feet extreme breadth, and 13 feet 7 inches moulded depth. The length between perpendiculars is 123 feet, and the moulded breadth 33 feet. The main body is constructed of steel to Lloyd's highest class. The beams of the main deck are of heavy section, and are supported by longitudinal truss-channel girders from the bottom of vessel on each side. These beams are carried out in one length to the extreme width of the vessel, forming the sponson deck. The wings are an integral part of the structure, being supported by the outward sweep of the ship's frame and shell plating. On these wings are two spacious houses, each of about 100 feet long by 10 feet 6 inches wide by 13 feet high, seated all round with handsome curve-back settee chairs divided by electro-plated elbows, affording seating accommodation for 222 passengers. On the hurricane deck two pilot-houses—one at each end—are placed, containing the steering gear for each end of the ship. Extending over the hurricane deck and embracing the pilot-houses, a light awning deck is fitted, shading a very commodious arrangement of deck seats. Electric light and steam heat are provided throughout the vessel.

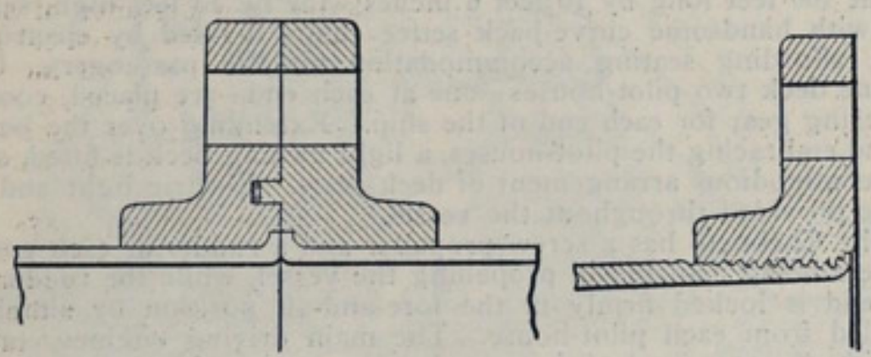
The Chebucto has a screw propeller and a rudder at each end, both propellers being actuated in propelling the vessel, while the rudder at the ahead end is locked firmly in the fore-and-aft position by simple gear controlled from each pilot-house. The main driving engines consist of two pairs of compound surface-condensing engines built upon one bedplate, and with low-pressure receivers separated only by a division plate. The cylinders are bolted together in line; the low-pressure cylinders, 24 inches diameter, inside, and the two high-pressure cylinders, 12 inches diameter, outside. The stroke is 18 inches, and when both engines are working, as is the case when the vessel is on her station, she is thus propelled by a double four-crank engine actuating a screw aft and a similar screw forward. Each of the propellers is 6 feet 3 inches diameter by 3 feet 3 inches pitch, having four blades of 15 square feet of surface, and with both front and back faces of blades of the same shape.

Trials of this vessel on the Clyde were first made with the engines coupled together, as she will run while on her station. Going at 160 revolutions, the air pumps making thirty-two strokes per minute, the power developed by the engines was close on 400 indicated horse power, and the mean speed over two runs on the measured mile reached 10 knots. The two engines were afterwards disconnected, and the forward engine remained stationary, while its shaft, from the thrust block outwards, was allowed to revolve freely. Propelled under these conditions a speed of nearly nine knots was registered. Due to the motion of the vessel through the water, the disconnected shaft was making about sixty revolutions per minute. For her voyage to Nova Scotia it was considered advisable, with the view of preventing strains on the shafting, that the engines should work independently, uncoupled when the two crank shafts join. In this connection it is worthy of note that the after shaft made 160 revolutions, whereas the forward shaft only made 148, although when the same shaft was running freely and not driven by the engine, it made, as above stated, about sixty revolutions. The entire absence of vibration when both engines were running in conjunction, as on the trial, was matter of remark, but when only one engine was in operation considerable vibration was felt. The Review is indebted to the Engineer of London for this description of the Chebucto.

Investigations made by the Railroad Gazette lead to the conclusion that if the railroads of the country are to get their rolling stock on a normal basis of efficiency—such as prevailed before 1893—their orders for 1897 should amount to 2,342 locomotives, 97,246 freight cars and 5,400 passenger cars. The orders actually given in the first three-quarters of the year are figured by the same authority at 771 locomotives, 27,700 freight cars and 179 passenger cars. About one-third the needed number of locomotives have been ordered and, as it happens, also, about one-third the number ordered in 1890. The freight car orders are one-third and the passenger car contracts about one-thirtieth what are needed to put the railroads in the condition they are wont to maintain in other than depressed times.

Care of Yachts and Small Steam Vessels.

There are always a great many details about the machinery of steam yachts and small steam vessels of all kinds that must have careful attention. Most yacht boilers are durable enough if fed always with clean, fresh water, and for this reason it is good policy to provide a filter in the main feed system. The filter is charged with hay or excelsior, and it takes care of oil and solid particles, keeping them off the heating surfaces of the boiler. The numerous valves which go with the steam and water systems are sources of trouble and danger if they are of poor quality, but there are plenty of good valves in the market, and it is folly on the part of the steam yachtsman not to buy the best. Pipe joints, if properly made up in the beginning, will last through many seasons without giving any trouble. Copper piping is not much used nowadays, iron pipe and brass pipe of iron pipe size

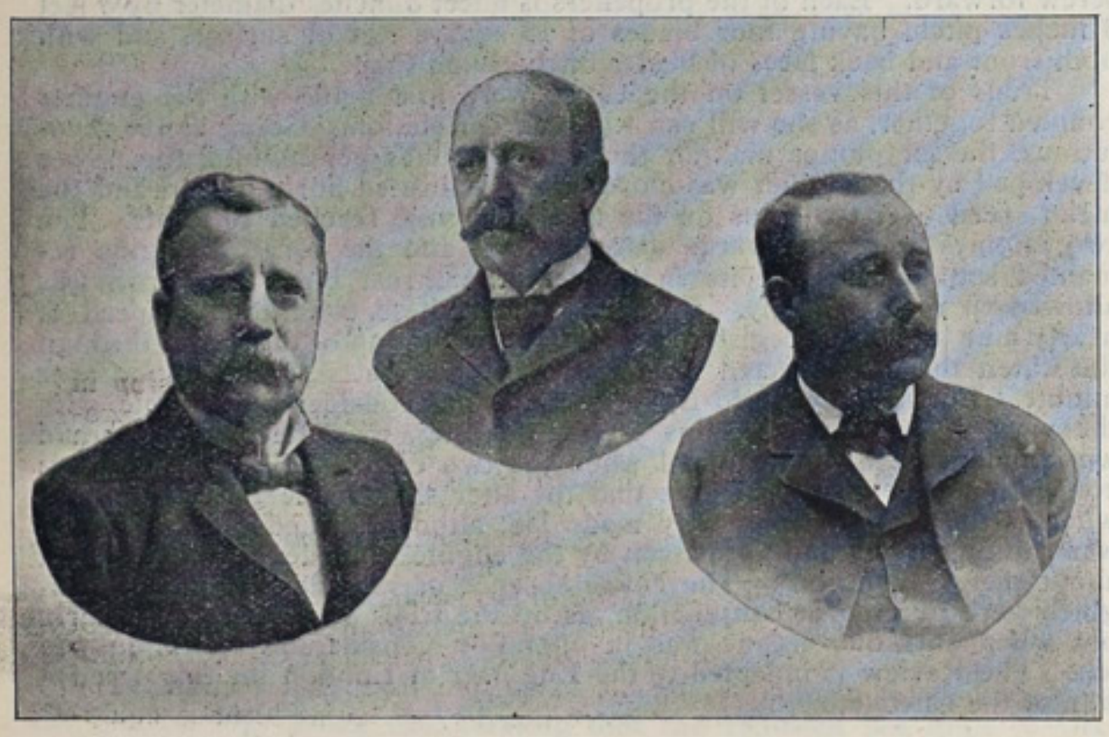


having come into almost universal use where formerly copper pipe was considered essential. The flange joint properly takes precedence for strength, and should generally be used in the larger sizes of pipe wherever it is convenient to put it in. Fig. 1 shows a male and female joint of this type, one that is widely used by some of our best eingineers and one that is economical of packing. It requires fewer bolts than the ordinary flat joints. In the case of copper piping the pipe end is turned into a recess in the flange and is also expanded with the hammer, and finally is riveted and brazed or sweated to the flange. With iron pipe it is a good practice, and one that is frequently followed with large sizes, to turn over the end of the pipe after it has been screwed home. This is shown in Fig. 2. The effect is to give a tight connection to the flange, and, in addition, to greatly diminish the liability of pulling out.

There is usually a much greater running of water into engine room and fire room bilges than is necessary. First there is the water from the engine bearings, if hollow brasses are used. In this case the water can be conveniently piped overboard—that is, if the supply comes from the circulating pump, which will give it ample pressure. Then there are the drippings from the various pumps. Substantial drip pans of steel plate, and deep enough for good capacity, should be provided under each pump. It is best to have the drip pan form part of the bed plate. Whether the boat be of steel or wood construction, dry bilges assist in her preservation and afford a neatness which is of itself worth attaining.

Practically all of the lubricating oil used on board should be caught in the crank pits or in suitable drip pans. This oil can be sold to junk dealers, who can clean it and get a good price for it.

The process of cleaning fires is a distressing one for all hands on board a small steamer. With hand firing the cleaning is long drawn out and gives both yacht owner and fireman one or more miserable half hours each day. If mechanical stokers were more commonly in use on yachts there would be much less talk about the noisome smells from the fire room, for these devices reduce the necessary cleaning of fires to a minimum. It may be that the yachtsman, who is ever willing to pay for luxuries, will be the pioneer in successfully installing mechanical stokers afloat. Up to this time they have not made any considerable headway either in the merchant marine or in the navy.—Iron Age.



J. H. KELLERAN. JOHN GORDON. H. L. CHAMBERLIN.

BUFFALO'S NEW FIRM OF VESSEL AGENTS, JOHN GORDON & CO.

Capt. Fred Green of the whaleback barge No. 129 was accidentally killed at Ashland Tuesday while his ship was being loaded with ore. He was standing on deck when a piece of ore weighing 100 pounds struck him on the back of the head, crushing his skull.

Hunters' Rates—Via the Nickel Plate road to designated points in the northwest, and southwest; also to local points in western Ohio and northern Indiana. No. 353, Nov. 15.

Draft of Water in Detroit River.

Contrary to expectations the draft of water in the Detroit river has at no time during the past week been below 17 feet. Following are the readings of the gauge at Ballard's reef, furnished to the Lake Carriers' Association by Duff & Gatfield:

DATE.	DRAFT.	WIND.
Oct. 12, 6 p. m	17 ft. 4 in.	N. W., light.
" " midnight	17 ft. 5 in.	W., light.
Oct. 13, 6 a. m	17 ft. 6 in.	N. E., light.
" " noon	17 ft. 6 in.	N. E., light.
" " 6 p. m	17 ft. 7 in.	E., light.
" " midnight	17 ft. 9 in.	S. E., light.
Oct. 14, 6 a. m	17 ft. 3 in.	S. E., light.
" " noon	17 ft. 7	S., light.
" " 6 p. m	17 ft. 4 in.	S. W., light.
" " midnight	17 ft. 5 in.	S. W., light.
Oct. 15, 6 a. m	17 ft. 6 in.	S. W., light.
" " noon	17 ft. 3 in.	W. S. W., fresh.
" " 6 p. m	17 ft. 6 in.	S. W., light.
" " midnight	17 ft. 5 in.	S. W., light.
Oct. 16, 6 a. m	17 ft. 2 in.	W., light.
" " noon	17 ft. 5 in.	W., fresh.
" " 6 p. m	17 ft. in.	N., fresh.
" " midnight	17 ft. 7 in.	N. E., light.
Oct. 17, 6 a. m	17 ft. 4 in.	N., light.
" " noon	17 ft. 6½ in.	N. E., light.
" " 6 p. m	17 ft. 4½ in.	E., light.
" " midnight	17 ft. 6½ in.	N. E., light.
Oct. 18, 6 a. m	17 ft. 7 in.	E., light.
" " noon	17 ft. 5½ in.	Calm.
" " 6 p. m	17 ft. 9 in.	Calm.
" " midnight	17 ft. 6 in.	N. E., light.
Oct. 19, 6 a. m	17 ft. 4 in.	Calm.
" " noon	17 ft. 7 in.	S. E., light.

Stock of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, Oct. 16, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	3,119,000	19,766,000
Duluth	3,288,000	486,000
Milwaukee	167,000	336,000
Detroit.	301,000	22,000
Toledo.	341,000	480,000
Buffalo.	1,460,000	892,000
	8,676,000	21,982,000

As compared with a week ago, the above figures show, at the several points named, an increase of 860,000 bushels of wheat and 856,000 bushels of corn. On the same date there was afloat on the lakes 2,069,000 bushels of wheat, 1,826,000 bushels of corn and 2,508,000 bushels of oats. Grain afloat on the canals aggregated 523,000 bushels of wheat, 1,041,000 bushels of corn and 391,000 bushels of oats.

5000 Candle-Power Emergency Light.

The Wells light has now become so common, and proved so satisfactory, that surprises may be expressed at its makers bringing out another high-candle-power oil light working on a different principle. The new light, however, which is illustrated herewith, is not intended to replace the older one, but for use in circumstances where the eight or ten minutes needed for heating the vaporiser cannot be spared, as at fires, break-downs, etc., where every minute of time becomes of serious import. The new lamp is a spray, and not a vapor lamp. The first of all the high-power oil lights was worked on this principle. As then constructed, however, the power required to produce the spray was considerable, whilst as now made by the Wells Light Mfg. Co., 46 Washington street, New York, a boy can easily maintain one of the lights in full activity. The lamp consists of a reservoir containing oil, and fitted with an air-pump, by means of which a pressure is maintained in the space above the oil. This pressure is then utilized to force the oil up to the burner in the usual way. At the same time, however, a second pipe coming from the top of the reservoir leads air to the sprayer, which completely breaks up and shatters the oil as it flows from the burner. A pilot light fitted with a wick is kept constantly burning, and immediately the cock shown on the standard is turned, the flame starts into full activity. Closing this cock puts out the flame instantly, so that the lamp can be used very conveniently for signalling purposes. The standard, with its oil and air tubes, can be completely detached from the air reservoir, the two tubes aforesaid passing into this reservoir through glands, as shown in the figure, which, on replacing the apparatus, only require tightening up for the lamp to be ready for use. This lamp should prove useful on ore and coal docks, around dry docks, etc. The illustration is from Engineering of London.

All charts sold by the Marine Review are corrected to date of sale.

Ship Yard Matters.

In all their parts, down to the smallest details, the big wheels of the new side-wheel passenger steamer City of Buffalo will be exact duplicates. The Dry Dock Co. is already actively at work on this vessel. All of the orders for material were made out before the contract was signed, so that there would be no delay in beginning operations. It is, of course, expected that this vessel's name will be Forest City. Buffalo was honored in the christening of the City of Buffalo, and it would not do to slight Cleveland people when there is another ship to name. "City of Cleveland" can not be selected as the D. & C. line already has a boat of that name. Lorain people are asking Mr. A. B. Wolvin to take the name Lorain City for the freight steamer which the Cleveland Ship Building Co. is constructing for him at that point. A big steel works and a ship yard have given Lorain quite a boom, but the town probably lacks a few souls in the count necessary to make it a city. It is said that the steamer building at West Superior for the barge company will be named Alexander McDougall, in honor of the general manager of the company and the father of the whalebacks.

Although the big Standard oil barge built at Buffalo, is being prepared for a trip to the coast, where she will be used during the winter, there is no truth in the report that another vessel of this kind is to be built shortly at West Superior. Mr. R. C. Veit of the shipping and lighterage department of the Standard company says that another barge has not been thought of as yet. The crane that is to span one of the building slips at the West Superior yard is being built by the barge company from designs furnished by the Wellman-Seaver Engineering Co. of Cleveland.

Not long ago the manufacturers of stockless anchors found great difficulty in introducing them on lake vessels. Nobody would now think of sending a new vessel out without stockless anchors. An anchor of the old style would not be taken as a gift. Several foreign orders received lately by the Baldt Anchor Co. of Chester, Pa., speak well for the popularity of that type of stockless anchor. The manufacturers report that they have just made a shipment of anchors to Holland and have an order in hand from Japan.

The Goodrich Transportation Co. will probably not undertake until next winter the important changes that have been planned for the passenger steamer Virginia. They have, however, awarded to Burger & Burger of Manitowoc the work of lengthening the wooden steamer Ludington and making other changes suited to a large increase in passenger accommodations.

Three more steel barges for St. Lawrence river grain trade between Prescott and Montreal will be built by the Bertram Engine Works Co. of Toronto for the Prescott Elevator Co.

More Firing on Dumont.

Editor Marine Review:—I write to say I am in hearty accord with the ideas expressed in an article signed "Veritas" that appeared in your issue of the 7th inst. Take, for instance, the act of congress approved Jan. 18, 1897, which was evidently suggested by the board of supervising inspectors of steam vessels, and if not, then it must have been referred to them and approved by them before its passage. This law requires a vessel of over 15 tons burden with a naphtha engine, to be used for auxiliary purposes, to carry a licensed engineer. Now, as a matter of fact, steam engineers know nothing about naphtha engines, unless they have made a special study of them, and it is a great hardship on owners of such vessels to have to employ a licensed steam engineer for a purpose which is made use of only in case of necessity and which any person of ordinary intelligence can operate. There is just about as much sense or necessity for a licensed engineer on a naphtha launch as there is on a trolley car. The owners of these vessels demand immediate relief from this oppressive tax, and I would like to know how long ship owners are to suffer from these nonsensical exactions adopted in consequence of a want or lack of practical knowledge and experience to guide our legislators in their framing of laws in these matters?

We want to get rid of the frequent amendments and changes now made, which tend to confuse those for whose guidance they are intended, and to secure for the future permanent laws, with a set of rules and regulations based on practical knowledge and experience. If the present board was composed of men of such ability, they would not have allowed themselves to be held up to public ridicule on account of their reversing the decisions of the local inspectors alleging mere technicalities for so doing. The government pays the members of this board good salaries, because they are supposed to be men of undoubted ability in all matters pertaining to the inspection service and have no need of depending upon or waiting until suggestions are made from others.

Every day new instances come to light to show what a great political machine the office of the supervising inspector general of steam vessels is. Only today I have learned that this great trimmer for political influence has lately defied even the rules of the civil service and recommended a man to fill the vacant inspectorship of hulls in the Grand Haven local district without his having passed a competitive examination, simply because he had a pull, when there was at least one eligible who had taken the examination and passed with an average of 88 per cent. as far back as July 22 last.

I notice that a great deal is made of Dumont's long service, but this can only be ascribed to the political pull that he has and not to his ability or practical knowledge, such as is required of an inspector general of steam vessels. He also makes much of the large increase in the number of passengers since he entered the office and the decrease in the loss of life, as if that were due to his able management and not to the great improvements in life saving appliances, and incidentally to want of accidents. In this respect I desire to say if his administration had been free from outside influences there would have been much less loss of life, although I believe that it has been much larger than he states, because he does not estimate on all American steam vessels everywhere, but only on those within the waters of the United States; and it is well understood, anyhow, that these figures are made up in such a way that no reliable statistician would consider them for a moment.

In conclusion, I could refer to many cases that would tend to show that the suggestion of "Veritas" to reorganize the entire board by means of a competitive examination cannot be carried out too soon, and I am satisfied that in the interests of ship owners and the public an immediate change is demanded from the incompetent and oppressive rulings of this mutual administration society, which only meets once a year to exchange congratulations upon their success in holding their positions, have their pictures taken, attend several banquets and then adjourn.

New York, Oct. 18, 1897. OBSERVER.

Ships of the United States.

When Mr. E. T. Chamberlain, United States commissioner of navigation, gave out, a few days ago, a short summary of the statistical part of his annual report, particular attention was given to the great increase in tonnage on the lakes. This summary contained other interesting statements regarding American shipping, which were omitted in the dispatches from Washington, and a copy of it, which has just been received, is therefore printed herewith in full:

"The Great Lakes region for the first time in our history," says Mr. Chamberlain, "has built more tonnage (year ending June 30, 1897,) than all the rest of the country—120 vessels of 116,937 gross tons, compared with 771 vessels of only 115,296 tons. Our increase in tonnage for the last decade has been almost wholly attributable to growth on the great lakes. In 1887 of a total tonnage of 4,271,228 gross tons, 3,181,804 were salt water tonnage documented on the Atlantic, Pacific and Gulf coasts, and 1,089,424 fresh water documented on the great lakes, Mississippi and tributaries. In 1897 of a total of 4,769,020 tons, 3,086,808 tons were documented on the seaboard and 1,682,212 of fresh water, the tonnage of the great lakes increasing from 733,069 tons in 1887 to 1,410,103 in 1897. During the decade steam tonnage has increased 816,000 tons, of which increase 590,000 tons belong to the great lakes system.

"The total construction in all parts of the country for the year ended June 30, 1897, 891 vessels of 232,233 gross tons, is the largest annual output since the fiscal vear ended June 30, 1891, when it reached 1,384 vessels of 369,302 tons. The year of our greatest construction was 1855, when we built 2,027 vessels of 583,450 tons. The square-rigged sailing vessel has virtually ceased to be a product of American ship yards. No ships or barks were built in the United States during the past fiscal year, and only one barkentine. By special act congress admitted one foreign-built bark to registry.

"The total documented tonnage of the United States, 4,769,020 tons, is the largest for twenty-one years, except 1893, when it was 4,825,071 tons. Our largest documented tonnage was 5,539,812 tons on June 30, 1861. Considering the speed and number of trips of steam vessels compared with sailing vessels, our merchant fleet has never before been so efficient as this year. The steam tonnage amounts to 2,358,558 tons; sail tonnage, including barges and canal boats, to 2,410,462 tons. Construction thus far indicates that at the end of the current fiscal year the steam tonnage for the first time in our history will exceed the combined tonnage of documented sailing vessels, barges and canal boats. By act of congress in 1874, about 600,000 tons of canal boats and barges were exempted from documents, and are no longer carried on the government's books.

"The government's average annual expenditures for maritime purposes, including river and harbor improvements, amounted to $21,000,000, toward which foreign shipping, though conducting three-fourths of our foreign carrying trade, contributed last year $660,000. Fully 20 per cent of the foreign tonnage enters the United States in ballast and clears with cargo.

"The American tonnage sold to foreigners amounted to 8,243 tons, the smallest amount since 1844. The largest amount sold foreign in a year of peace was 77,054 tons in 1874. During the four years preceding the close of the civil war the American tonnage sold to foreigners amounted to 774,652 tons. During the past four years 38,828 tons of foreign-built vessels have been admitted to American registry compared with 64,778 tons for the previous four years.

"The tonnage registered for foreign trade amounted to 792,845 gross tons, the lowest since 1841. The greatest was 2,496,894 tons in 1861. One steamer like the St. Louis, which is of nearly 12,000 tons, is equal, however, annually as a carrier to over twenty of our ships before the war. The whale fisheries employ 12,714 tons compared with the maximum, 198,594 tons, in 1858. About 10,000 men are employed in deep-sea fisheries, of whom 6,500 are citizens of the United States."

Heavy Production of Pig Iron.

Monthly pig iron statistics furnish eloquent proof of the expansion in the demand for iron during the past few months. From a weekly product of 165,000 tons on August 1 the capacity at work has risen to 200,000 tons Oct. 1, and yet stocks have declined over 200,000 tons, of which by far the greatest quality was absorbed during September. It is quite clear, therefore, that consumption lately has expanded even more than production, so that there is nothing alarming in the known fact that additional furnaces are getting ready. As a matter of fact, nearly every well equipped furnace in the territory west of the Alleghany mountains and north of the Ohio river will be running by Nov. 1. That means that nothing more is to be expected in the way of expansion from that section. The south is in a position to produce more heavily, so far as furnace equipment is concerned, but it will not be quite so easy to provide the necessary fuel and ore. The east, of course, has many plants idle, and a considerable number are in shape to start operations. A good many stacks are carried along in the lists because they have not been actually dismantled. They might as well be in the South Sea islands so far as their ability to make iron at a profit is concerned. We do not believe that the real live capacity in the country is much above 225,000 or 230,000 tons a week. We are not likely to reach the necessity for such a total, with the winter before us, and the usual slackening of consumption during that season.—Iron Age.

Owing to delays caused by breaks in the canal, the Welland will be kept open on Sundays for the balance of the season.

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats	416	45,109.47
Total	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30.	1891	204	111,856 45
" " "	1892	169	45,968.98
" " "	1893	175	99,271.24
" " "	1894	106	41,984.61
" " "	1895	93	36,352.70
" " "	1896	117	108,782.38
Total		864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (*From Official Reports of Canal Officers.*)

	St. Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered	17,219,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation	232	231	234	365	365	365

*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

Although American grain routes from the northwest to the Atlantic seaboard, and American lake vessels, are each year taking traffic from the St. Lawrence route, the Canadian authorities do not seem to tire of their effort, under great financial disadvantages, to complete the St. Lawrence canal system. They are again prompted to activity by the progress that is being made with improvement of the Erie canal. A conference was held recently at Montreal between the government representatives and those of the Montreal corporation and commercial bodies. It was agreed that the harbor facilities of Montreal must be greatly improved and plans were submitted for the construction of a number of new docks with modern equipments. Premier Laurier and Minister of Public Works Tarte declared it to be the intention to push the improvements on the canals as rapidly as possible. The Welland canal is to be still further deepened, the St. Lawrence canals enlarged and deepened, and the channel between Quebec and Montreal deepened to a depth of 30 feet. Minister Tarte said he had visited Boston, Portland and Buffalo and had there seen American elevators handling Canadian produce. Premier Laurier said that while it was the intention of the government to complete the canals at an early date, it seemed to him that all the money that had been spent in their great canal systems would be money lost unless the harbor of Montreal was fully equipped to handle all the trade that could be obtained.

When rapid work in ship yards of the United States is referred to, it is sometimes said that only in the building of cargo vessels—steam-barges so-called—can any claim be made for efficiency. But there are a couple of instances at hand just now of large passenger vessels, one of them costing $375,000, the contracts for which call for completion within six months. The side-wheel steamer to be built for the Cleveland & Buffalo Transit Co. by the Detroit Dry Dock Co. is to be delivered in practically six months from the time of beginning work, and the Cramps of Philadelphia will have finished the steamer Miami, another large passenger steamer, within six months of the date of signing the contract. The Miami is a steamer 240 by 40 by 23 feet, built for H. M. Flagler to ply between Miami, Fla., and the Bahama islands. She has three decks and is to be propelled by two sets of triple expansion engines. A complete electrical equipment and all other conveniences applied to passenger steamers will be found in this vessel. Her equipment will include the hooks for life boats, manufactured by the Standard Automatic Releasing Hook Co. of New York, which were selected after they had been carefully examined by Mr. E. Platt Stratton.

A private trial of the submarine wrecking boat Argonaut, built by the Columbian Iron Works, Baltimore, Md., after the design of Simon Lake, the inventor, was made recently in the dry dock of the Columbian Iron Works. The vessel was submerged in 21 feet of water, remaining under the surface for two hours, during which time constant communication was kept up by means of a rubber tube with the six men who were in the vessel's cabin and engine room. The crew stated that during the entire time they suffered no inconvenience from lack of fresh air. A number of tests of the engines of the vessel were made, and while the trial was merely preliminary, it is claimed that enough was learned to make it certain that the boat will be able to perform the work for which she is designed—namely, the recovery of cargoes from sunken vessels and any other work of a submarine character.

The announcement that the movable dam in the St. Mary's Falls canal above the locks, which is intended as a safeguard in event of accident to the docks, is to be replaced during the coming winter by a set of swinging gates similar to the lock gates now in use, is a matter of special importance to the vessel interests, as the mitre sill of this dam is an obstruction to the deeper navigation that will be provided when shallow places in St. Mary's river are fully dredged out in accordance with the 20-foot channel project. It would be a great advantage to the vessel interests to have this improvement completed on the opening of navigation next spring, so that full advantage could be taken of the dredging that is now going on elsewhere in the river.

There is printed elsewhere in this issue another communication from New York that contains severe criticism of the steamboat inspection service. The Review would take more interest in the contents of these communications if permission was given to sign the names of correspondents, but in every case the claim is made that the heads of the steamboat service could, if they saw fit to do so, injure anyone who would publicly oppose them. The correspondents are connected with large shipping interests in New York, and their excuse for not signing names is therefore accepted. It is quite plain that an effort is again being made to have the treasury department undertake important changes in the steamboat inspection board.

When the Oceanic of the White Star Line first came out, about twenty-seven years ago, she was so "long and narrow" that some of the oldest Atlantic salts began to seriously speculate as to the chances of her breaking in two when going through a head sea, such as is often met with near the banks. Results proved clearly that her enterprising builders were right, and the aforesaid salts wrong, for, independently of the general success of the White Star fleet, there are no ships so easy in a seaway as those of the new type first designed and built by Messrs. Harland & Wolff. Perhaps the worst "pitchers" that were ever constructed were ships of 240 feet keel and of large beam. Anyway, a long ship with fine ends is constructed on the principle of the strongest form of girder or fulcrum-beam known to science.—Nautical Magazine.

The United States now has only five torpedo boats—Cushing, Ericson, Foote, Porter and Dupont—but with sixteen others now building we will soon have twenty-one; quite an increase over five, but still very few in comparison with other countries. Taking last year's figures, England has 256, France 244, Russia 185, Germany 155, and Spain forty-six. Of England's 256, forty-two are of the class known as torpedo-boat destroyers, or vessels which, in addition to being equipped for attacking with torpedoes, are especially designed to destroy other torpedo boats. The trial speeds of these forty-two boats vary from twenty-six to twenty-eight knots. England also has twenty-eight torpedo vessels building, designed to attain a speed of thirty knots, and has just let contracts for several others designed to attain a speed of thirty-two knots.

Denison B. Smith, secretary of the Toledo Produce Exchange, asked the Marine Review for an estimate of the value of all ships owned on the lakes. The answer was $85,000,000, including new vessels now under contract in ship yards. The figures were made up from a summary of insurance values placed on vessels in the Inland Lloyd's Registry, with additions on the same basis covering a very large number of vessels of which there is no record in the registers of either 1896 or 1897.

If the law relating to the displacement or injury of buoys is not of a kind that will admit of conviction and severe punishment when carelessness on the part of vessel masters is proven, the vessels owners should immediately take steps to provide such a law. It is their duty to assist officials of the light-house service in protecting all aids to navigation, but especially the gas buoys, which are very costly and which have been liberally provided for the lakes of late.

Each of the two propellers of the Kaiser Wilhelm der Grosse weighs twenty-six tons and is 223¼ inches in diameter. The ship's massive engines sling them around seventy-seven times in a minute. The Kaiser Wilhelm has a bunker capacity for 4,950 tons of coal. The engine and boiler room staff comprises seventeen engineers, seventy-five coal passers, ninety stokers and eighteen oilers.

The navy department has adopted bottle green as the official color for torpedo boats. Chief Naval Constructor Hichborn has informed the superintending constructor at Norfolk of this action and directed him to paint the vessels of the torpedo boat flotilla now on their way to that yard with this color.

German authorities predicted a yearly traffic of 5,500,000 tons for the Kiel canal, but the second year's traffic only shows a passage of 2,036,861 tons. As a strategic waterway for the German navy this canal may prove a good thing, but from a commercial point of view it is a disappointment.

The Eophone Co. of New York has an order from the treasury department to install one of its instruments, a description of which appeared in a recent number of the Review, on one of the new revenue cutters for the lakes.

The great Armstrong ship building works in England which cover two miles of the north bank of the Tyne, employ some 20,000 men, have a capital of $20,000,000 and earn $2,500,000 a year in profits, were established fifty years ago.

It is expected that the model tank under construction at the Washington navy yard will be completed by next spring. The work of construction is in charge of Assistant Naval Constructor F. B. Zahn.

Harland & Wolff of Belfast are said to have just closed contracts with the White Star Line for two cargo steamers, each over 600 feet in length.

English and American Ship Yards.

MR. W. I. BABCOCK, GENERAL MANAGER OF THE CHICAGO SHIPBUILDING CO. WRITES OF HIS OBSERVATIONS AT THE RECENT CONGRESS IN ENGLAND—A BROAD AND INTELLIGENT DISCUSSION OF A SUBJECT THAT NOW INTERESTS THE NATION.

[This article, which appeared originally in the Marine Review of Sept. 2, 1897, has been copied in numerous publications throughout England, Scotland and the United States, and is now reprinted upon suggestion from leading representatives of the ship building industry in the United States, who are of the opinion that it should be given wide circulation in this country.]

Editor Marine Review:—In giving you briefly some results of my observations at the recent International Congress of Naval Architects and Marine Engineers in England, I shall not speak particularly of the magnificent reception given to the foreign delegates, nor of the warmth and cordiality of the greetings accorded us, which have already been fully described in your paper; nor go into details of the arrangements of yards and shops or particular tools, but treat the matter in its broader aspects.

Any comparison between English and American ship yards must take into account at the very outset the great difference between the two countries as maritime powers. The United States, with nearly eighty millions of population, is essentially a self-contained country. The coast line is a mere fringe along its edge, and the vast majority of its people have not only never seen the ocean, but take little interest in it. Since the war the vast energies of its people have been principally devoted to the internal development of the country, to the building of its railroad systems for internal communication, to the subjugation of the soil from its virgin condition to the use of man, especially in the vast empire beyond the Mississippi, and to the establishment of tremendous manufacturing industries whose chimneys now dot the whole broad land. In all this the maritime industries have languished from neglect, the ship yards of the country are very few and far between, and, but for the wise navigation laws requiring all coastwise business to be carried on only in home-built vessels, would scarcely exist at all, and the number of skilled men is limited. The natural consequence has been that the amount of work in the few yards we have has been a very variable quantity; a few orders happening to come together make the yards, for a few months, crowded with work, and finding it difficult to secure men enough; then, with bare stocks and empty shops for a time, the men scattered, even a large proportion of the foremen, draughtsmen and office force necessarily laid off until returning work again demands their services. All this inevitably has a very serious effect on the internal economy of any yard, reduces the efficiency of the organization, demoralizes the men, and largely increases the cost of building when the work can be had.

In Great Britain, on the contrary, we have forty millions of people living on a couple of islands off the coast of Europe. With the inhabitants of the mainland they have often been at war for the last thousand years, and from their isolated position great fleets have always been absolutely necessary to them, so that they could get at their enemies as well as repel invasion of their own country. Naturally a strong and dominant race, and overcrowded at home, they have found an outlet in colonies all over the globe, with which it has been necessary to keep up communication, and this could be done by water alone. An inventive and manufacturing people, whose products have been in continually increasing demand as their colonies extended and civilization spread over the waste places of the world, they have gradually become a nation of traders and artisans, withdrawing more and more from agricultural pursuits, until now the greater part, yes three-fourths, of the very food they eat comes from the foreigner. If the ships that bring it were interfered with in time of war, England would starve to death in short order. National existence itself thus depending on control of the sea, ship building and ship owning are among the great industries of the country. The coast line is dotted with ship yards from Southampton to the Clyde, the keels of their ships plough every sea from the Arctic to Cape Horn, and wherever they go the strong arm of England protects them with a war fleet such as the world never saw before.

As the completed ship is the sum of all human knowledge and endeavor, embodying in its complex structure the products of every trade and industry, while its operation and the business it carries on enlist the attention and efforts of all the financial and business interests, every man, woman and child in Britain appreciates the importance of ship building and follows its fortunes with intelligent interest and solicitude. To me, the most striking thing that I saw in England during my recent visit was this universal interest, manifested in many ways. However strange it may seem to an American, the glamour of royality still dazzles the son of the soil, and the fascination of a title or a decoration is yet strong upon him, and they are his most longed for and cherished rewards. Now, not only has every chief constructor of the British navy for many years been knighted, but this year the distinction has been conferred on the chief engineer as well; the sessions of the recent Congress of Naval Architects and Marine Engineers were opened in person by the heir to the throne; and, highest honor of all to British eyes, even the aged Queen herself showed her interest in the profession which has made her country what it is, by receiving the members of the congress at Windsor Castle.

But all this is, of course, the bright side of the picture, from the British point of view. If it had no reverse, the hopes of those of us who are working and praying to build up American interests, to get back to our own country its lost carrying trade, now mostly done by England, to awaken a sentiment here that will react on congress and force it to make the appropriation for that navy which all considerations of national interest and honor require that we should have, would surely be doomed to disappointment. Self-preservation itself impels us to accomplish these results, for, as Capt. Mahan has so well shown, all history teaches that strength upon the sea is absolutely necessary to make and keep a nation prosperous and powerful.

Now, the ability not only to build good ships but to build them as cheaply as any competing nation can, is one of the prime essentials, and it is, therefore, a great pleasure to be able to say that it is my deliberate opinion, after careful inspection of the various yards that were so freely thrown open to us, and of some others not on the regular programme of the congress, that, given work enough to keep our yards occupied all the time, our larger and more modern yards could build ships and make money at English prices, and this notwithstanding the fact that the wages paid on the Clyde—taken from an official list I obtained in Glasgow—average but 55½ per cent. of the wages we pay. This is due to the much greater use of labor-saving machinery in our yards, to their better arrangement for handling material, to, in many respects, better tools, and, last but by no means least, to the fact that we manage our own business, that the union and the walking delegate are not all-powerful with us, that master and man work together in America with mutual respect and esteem, that our mechanics are better and brighter workmen, more intelligent and taking more pride in their work, and our managers are always ready to try anything new in the hope it will be better than the old way.

The Britisher is very conservative. He believes in sticking to the bridge which has carried him safely over, and does not take kindly to new tools or new methods. A citizen of a great empire, secure in his belief not only that the sun never sets on British soil, but that the reason for it is that the sun knows his business and has no time to waste in seeing what other nations are doing, he listens, with politeness, it is true, but with ill-concealed disdain, to any description of new devices, and remains absolutely serene in his opinion that his own way is the only right way, his own tools the best tools. Consequently, many of the improved labor-saving appliances which are common with us, have no place on the other side. His yards are mostly long established and have grown from small beginnings, with the inevitable result of a more or less patchwork appearance and inconvenient arrangement. Land is valuable, and few of his yards have enough of it and are crowded in consequence, without sufficient room for the work. Naturally he does not want to throw out tools which are still in good condition because new and better ones are now on the market, even if he could be made to see their superiority, which he can not.

But in my judgment, the worst feature today in the British yards is the tremendous power of the labor unions, and the universal antagonism of the men to the masters. The exactions and obstructions of all kinds that are thrown about the work by these unions are almost inconceivable. When it comes to such a pass that an employer is deprived of the use of a crane for months at a time because two classes of his men can not agree as to which class needed repairs belong; when a boiler manufacturer is forced to absolutely shut down his works for weeks because of a similar dispute among his men; when strikes are ordered on the most trivial pretexts, and the leaders of the unions are always doing all that they can to keep up an antagonism between the men and the employers, even going so far as to keep men continually moving from one place to another for fear that they will become too friendly with the bosses; when in some places the men insist on electing their own foreman, who holds his position, therefore, at their pleasure; when the rule of the union is that one man shall run only one tool, though his hardest work may be to keep himself awake through the day if he is running a lathe set for a long cut in the morning, and that every tool must be run by a mechanic, no matter whether unskilled cheap labor would be sufficient or not, it is very evident to anyone who has any knowledge whatever of industrial operations that the cost of the work must be excessive. It is not too much to say that the tyranny of the trades unions has been the principal reason why the industrial supremacy of England, in many lines of trade, has already vanished, and in others is rapidly declining. Germany today sells more manufactured articles in England than England sells in Germany. English exports of iron and steel, hardware and cutlery, linens and woolens, are less than one-half now of what they were twenty years ago. Many industries have been driven out of England entirely, and "ruined by strikes" is the only fitting comment.

Already signs are not wanting that the Britisher will wake up some fine day and find that his superiority in ship building—about the only thing left to him—has vanished also. Next year the two largest ships on the Atlantic will have been built in Germany. Foreign orders for warships, which formerly all came to England, are now placed to a considerable extent in France and Germany, and even in Italy, and the Japanese have recently ordered two cruisers in this country, as we all know. The United States has outstripped England already in steel making, and ship material sells here today at lower prices than over there.

England is the richest nation in the world, but, largely on account of labor difficulties at home, her capital seeks investment in foreign countries rather than in her own. I was assured that not one ship yard in England today could interest new capital to any extent to make needed improvements. Probably this is an exaggeration, but the fact is undeniable that when the revival of American ship building and ship owning comes, when wise legislation enables us to again take our proper place on the sea, and American capital becomes available for the establishment of new and great ship yards, modern in every respect, then we can build ships cheaper than anywhere else in the world, and still pay the highest wages. We are only a very short distance behind in the race even now.

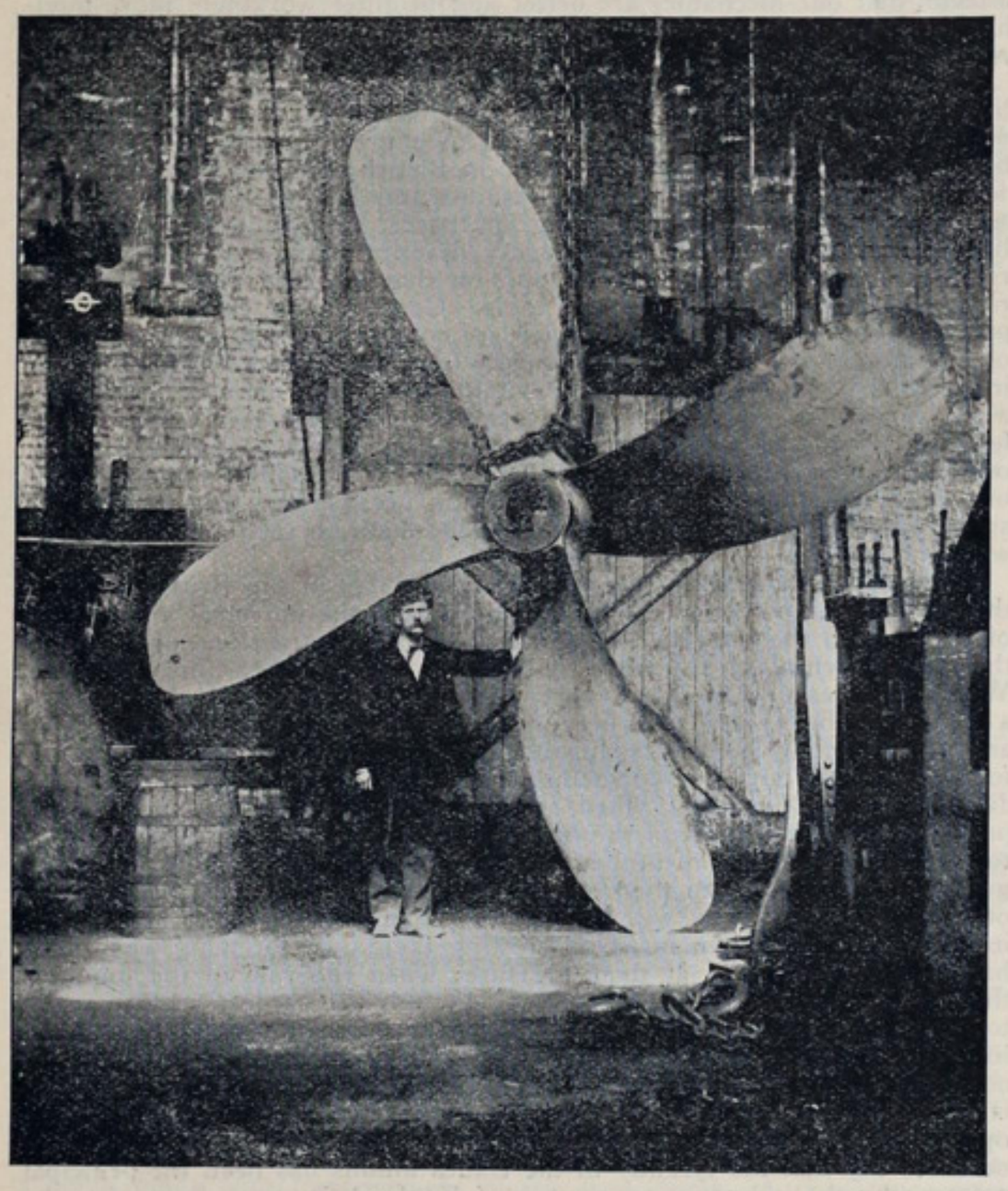
Chicago, Sept. 1, 1897. W. I. BABCOCK.

Secretary Long and Mr. Roosevelt.

There is a story afloat in naval circles to the effect that Secretary Long is seeking an appointment as senator from Massachusetts, and that, in the event of his election, Mr. Theodore Roosevelt will be appointed secretary of the navy. The term of Henry C. Lodge as senator from Massachusetts expires in 1899. As there is no vacancy for Mr. Long until then, he is likely to hold office for two years yet, which will carry him nearly through the term of President McKinley. Mr. Roosevelt and Mr. Long appear to be working very well together, and the chief seems to have learned how to make the most of the intelligence and brilliant aggressiveness of his assistant. It penetrates every department of the naval service, like a fresh breeze from old ocean, and seems to be blowing away some of the cobwebs of routine and precedent. It may possibly suggest to some, however, the story told of W. H. Seward when he was governor of the state of New York. As the driver of the stage on which Seward was riding refused to recognize the chief magistrate in the unpretentious person at his side, Seward accosted a gentleman passing who knew him, saying, "Won't you tell this man that I am the governor of New York?" "No, you are not," was the answer. "Who is then?" "Thurlow Weed."—Army and Navy Journal.

A Large Solid Wheel.

The propeller illustrated herewith was made by H. G. Trout (King Iron Works) of Buffalo for the steamer Pensacola of the Gulf Transit Co., Galveston, Tex. It is 14 feet in diameter and is the largest solid wheel ever made in Buffalo and possibly on the great lakes. Of course, a great many wheels of larger diameter are made at the Buffalo works, as well as at other places on the lakes, but they are of the sectional kind, the blades being cast separate and bolted to the hub. Mr. H. G. Trout's success with propellers has brought to him a large patronage, especially from the



south, where many of the large fruit steamers are fitted with his wheels. Among these latter may be mentioned a bronze wheel of 13 feet diameter, furnished recently to a New Orleans steamer. The Three Friends of Cuban fame and the Sommers N. Smith were fitted with Trout wheels. Engineers of the lakes will probably recognize the "man in the photograph," Mr. G. H. Wilson, who is well known as the foreman of the Trout works.

Powerful Electrical Machinery.

A notable addition to the already extensive electrical plant of the Niagara Falls Hydraulic Power & Mfg. Co. in the power house at the foot of the cliff, at Niagara Falls, N. Y., will shortly be made in the form of a General Electric Co. electrolytic generator which will be the largest of its kind ever constructed. It will be both liberally and carefully designed to enable it to cope with the very severe service of electrolytic work, namely, for practically continuous operation. This machine will have fourteen poles and will run at 257 revolutions, giving an output of 5,000 amperes at 175 volts, or a capacity of 875 kilowatts. It will be of the latest type and will be directly connected to the water wheel shaft. It will be provided with a special panel switchboard with full form K equipment of instruments necessary to handle a current of 5,000 amperes. The General Electric Co. is already well represented in the big power house of the Niagara Falls company. Two of its six pole 560 K. W. 300 revolution 650 volt railway machines, both directly coupled to the same turbine shaft, supply current to the Great Gorge Railway. In addition the station contains a General Electric booster and two other generators, one of 100 and one of 90 K. W.

A New York dispatch says that the American line management has made arrangements with the Newport News Ship Building & Dry Dock Co. for repairs and alterations to be made during the coming winter in the steamships St. Paul, St. Louis and Paris. The nature of the alterations to be made is not disclosed, but it is said over $200,000 is to be expended on the three vessels. Boilers and engines are to be overhauled, with a view to increasing the speed of the vessels.

New Station.

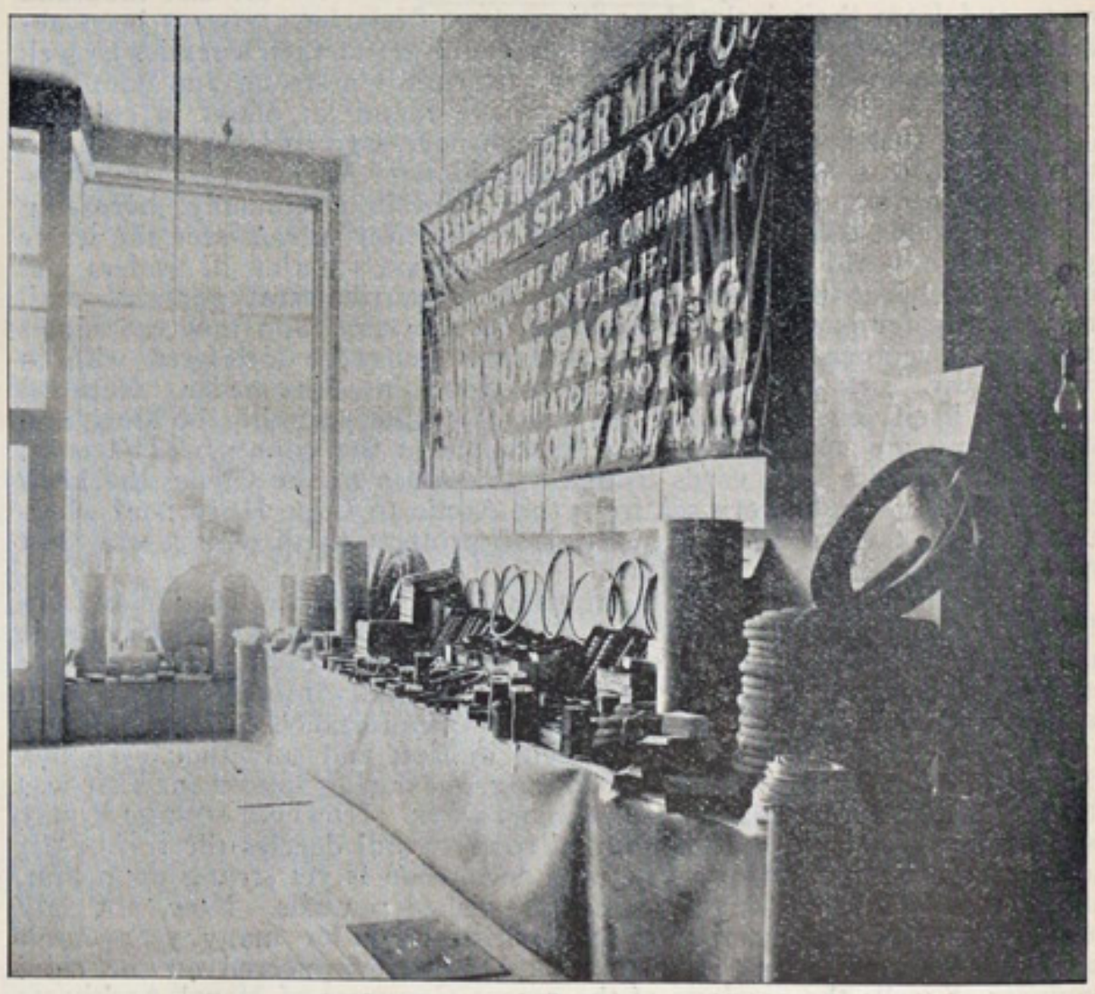
The new Twenty-third street station of the Pennsylvania Lines in New York is fast becoming popular with Cleveland people. The new cab service inaugurated by this line, with only a nominal charge, is what the people long have wanted. The 1:40 p. m. train from Cleveland has through sleepers to New York without change, and diner serving supper. This express train also makes quick time to Pittsburg, Baltimore, Washington and Philadelphia. For rates and full information call at City Ticket Office, 149 Superior street, Cleveland.

Railways of the United States.

The interstate commerce commission is late, as usual, with its summary of railway statistics, but the information which their report contains is nevertheless interesting. The total railway mileage of the United States on June 30, 1896, which is the date of the report, was 182,776 miles, an increase of 2,119 for the year. The aggregate railway capital was $10,566,865,771, which represented a capital of $59,610 per mile of line, or, if current liabilities be included as part of the capital, $63,068 per mile of line. The total capital stock amounted to $5,226,527,269, of which $969,956,692 was preferred. Of the total capital stock a fraction over 70 per cent. paid no dividends. The total dividends amounted to $87,603,371. The passengers carried during the year numbered 511,772,737, an increase of over 4,000,000 as compared with the previous year, which, however, showed a decrease of 33,266,837 as compared with 1894. The freight tonnage carried amounted to 765,891,385 tons, which was the largest ever reported for railways in the United States and an increase of nearly 70,000,000 tons as compared with the preceding year. The gross earnings amounted to $1,150,169,376, an increase of nearly $75,000,000 as compared with the preceding year. The net income showed an increase of more than $33,000,000 over the preceding year. There were in the hands of receivers on June 30, 1896, 151 roads representing 30,475 miles of operated road. This represented an increase of 18 roads as compared with the preceding year. The capital stock of the railroads controlled by receivers was $742,597,698 and the funded debt was $999,733,766. There were in service on the date of the report 35,950 locomotives and 1,297,649 cars of all classes, an increase of 251 locomotives and 27,088 cars compared with the corresponding date a year ago. The employees on the railways numbered 826,620 and their aggregate compensation amounted to over 60 per cent. of the total operating expenses of all railways, a slight decrease as compared with preceding years. The employees killed during the year numbered nearly 1,900, an increase of fifty, and those injured numbered nearly 30,000, an increase of over 4,000 as compared with the preceding year. Of the passengers carried 181 were killed and nearly 3,000 were injured. The persons other than employees and passengers killed numbered 4,406 and those injured 5,845. This classification includes trespassers. A comparison of the figures given shows that out of every 444 men employed on railroads one was killed, and that out of every twenty-eight men employed one was injured. For every 152 trainmen employed one was killed, and for every ten employed one was injured. Only one out of every 2,827,474 passengers carried was killed, and only one was injured for every 178,132 passengers carried on the roads.

Exhibit of Peerless Rubber Mfg. Co.

At the convention of the National Association of Stationary Engineers, held at Columbus recently, the Peerless Rubber Mfg. Co. of New York occupied a store opening into the main lobby of the hotel, and exhibited a full line of their engineering goods, particularly Eclipse sectional rainbow gaskets, Rainbow sheet packing, Honest John hydraulic and hercu-



les packings. They also exhibited their combination stop valve packing and Peerless piston packing. The Rainbow gauge glass rings, Anaconda steam hose for use in blowing out tubes, belting, hose, rubber valves, etc., were particularly attractive to the delegates. Their Rain-Besto gaskets for very high pressure being cut with metallic insertions, received especial attention. The exhibit was handsomely prepared and the goods made a fine showing. They will send samples to anyone desiring to test the merits of their goods. Hudson Dickerman of New York was in charge of the exhibit, W. J. Courtney being also in attendance. They presented the ladies with handsome bouquets on the night of the reception and entertained the delegates with royal hospitality.

The Duluth, Missabe & Northern ore docks made a new record in loading 56,000 tons in thirty-six hours recently. Eight Bessemer steamers loaded.

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building, Cleveland.

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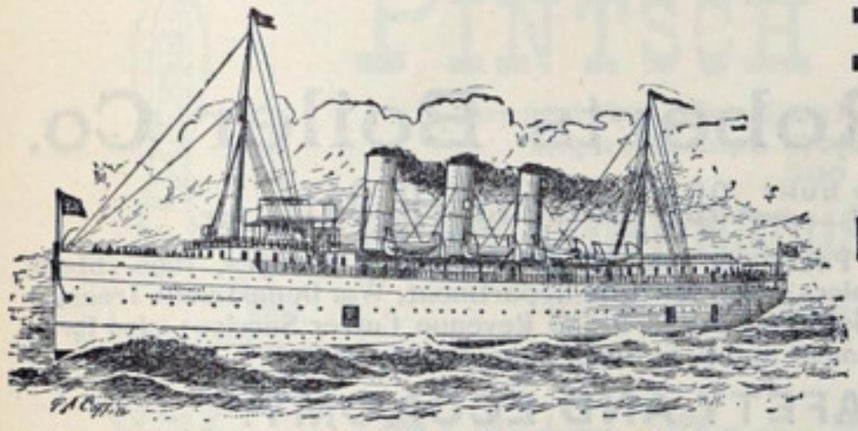

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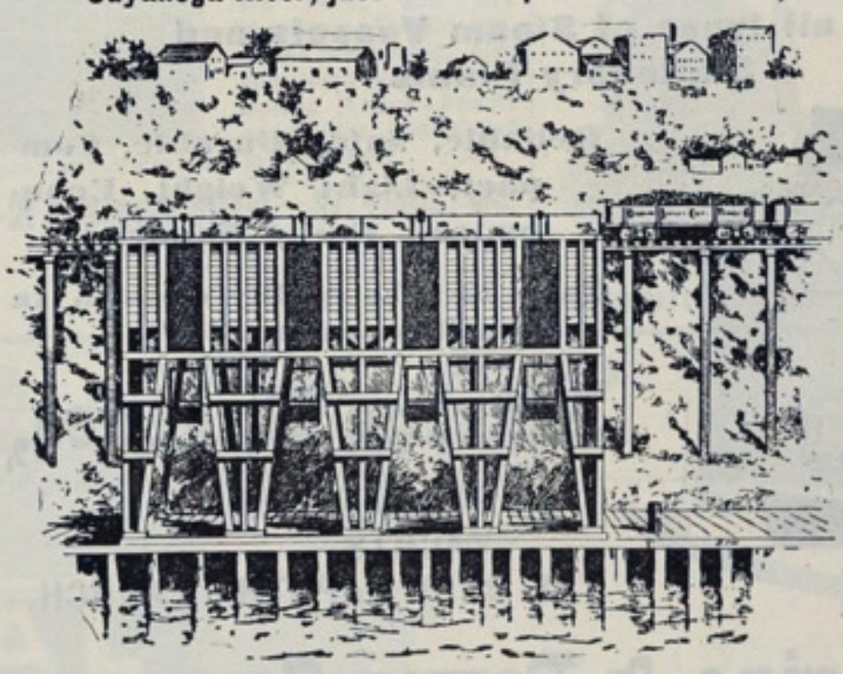

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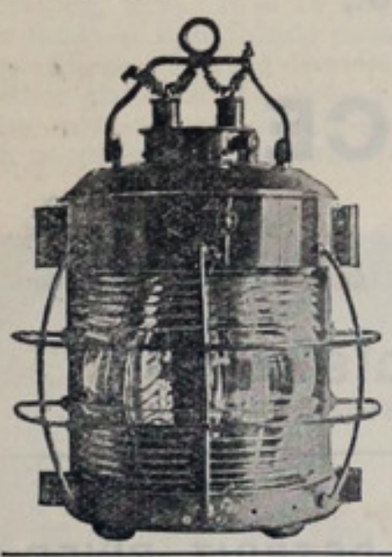

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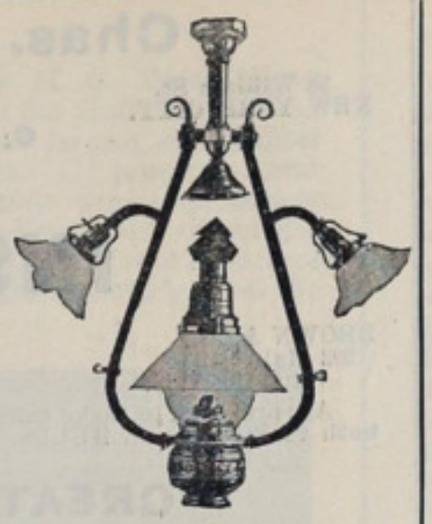

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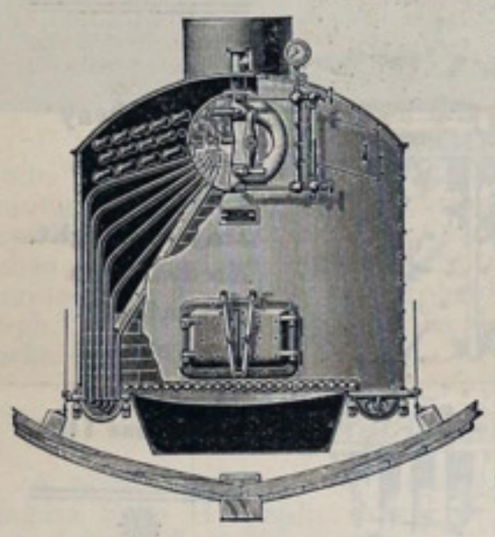

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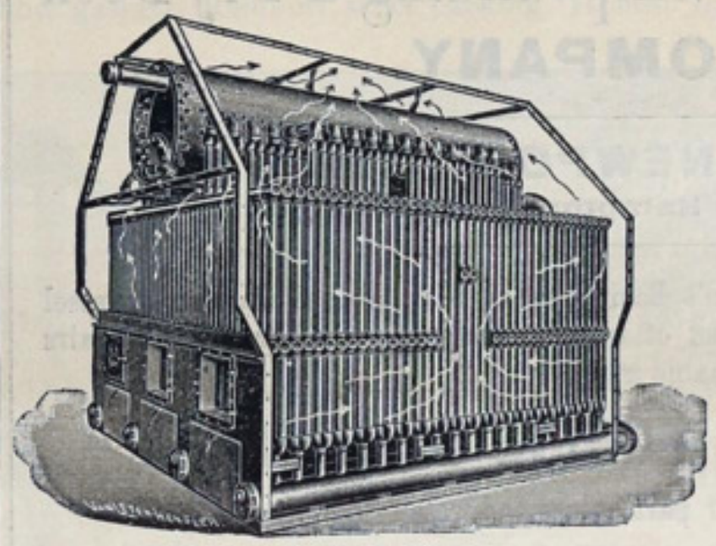

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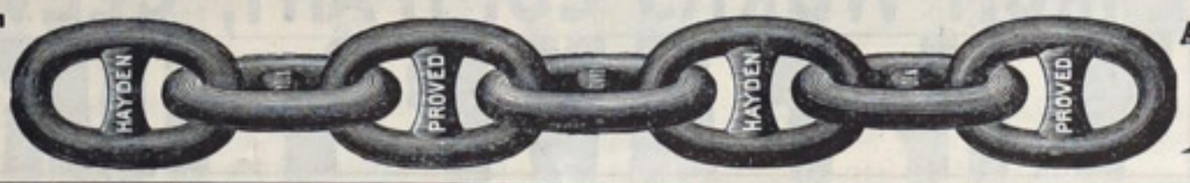

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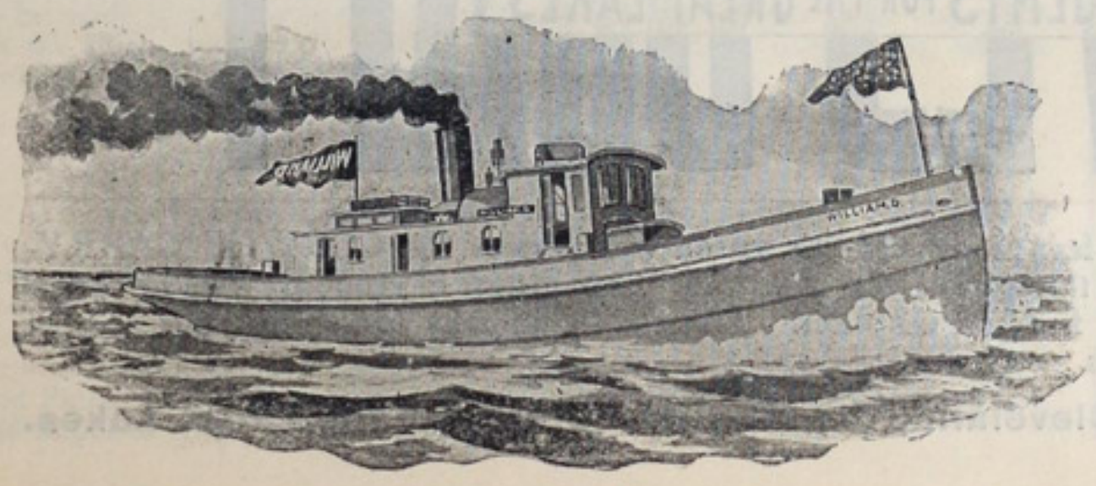

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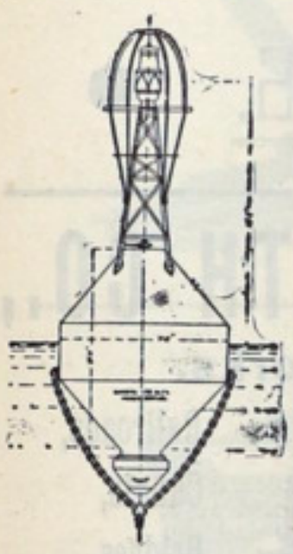

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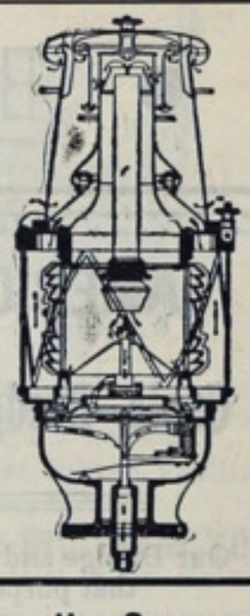

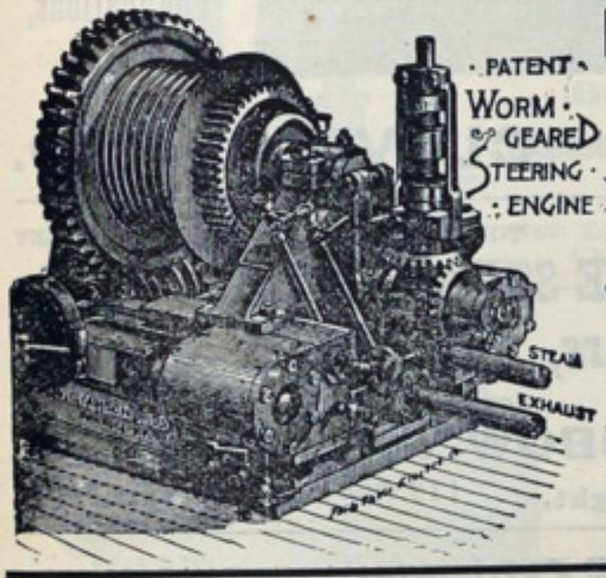

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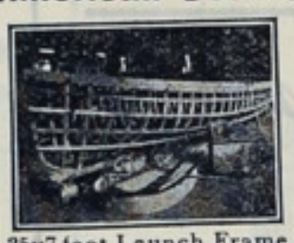

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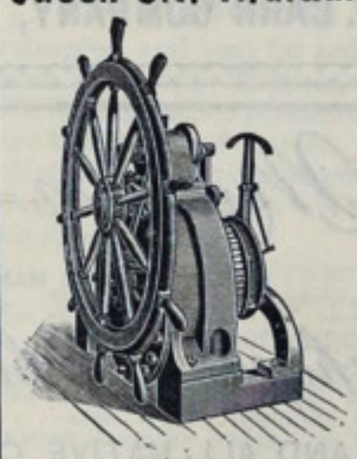

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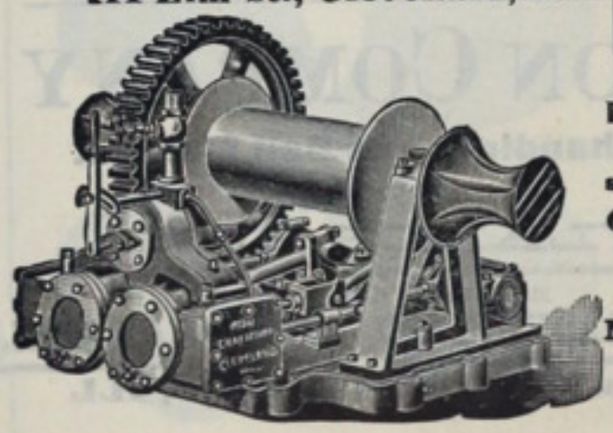

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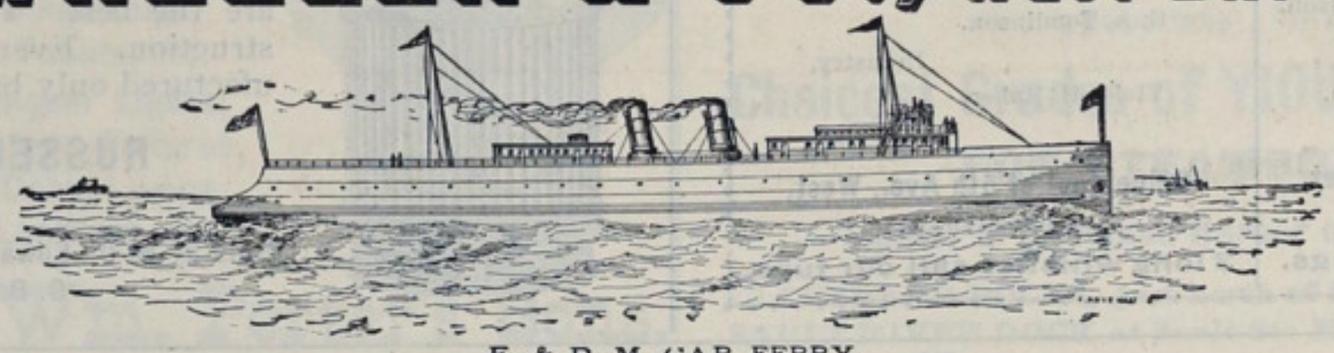

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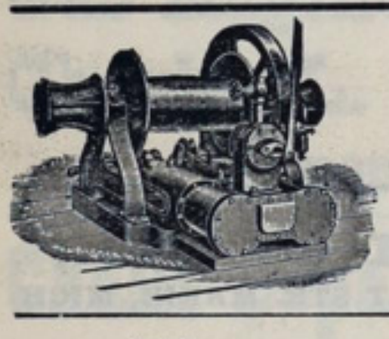

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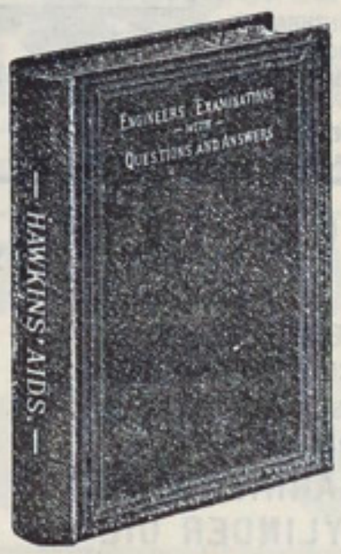

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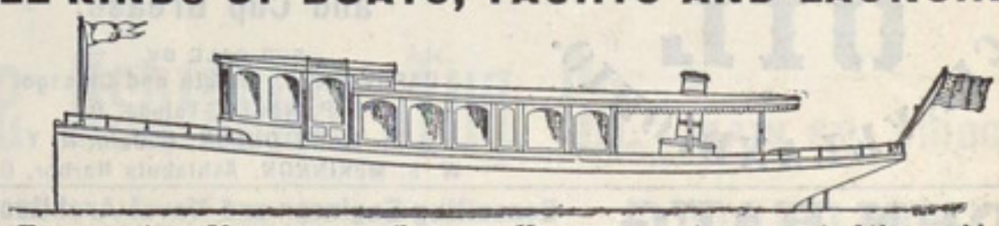

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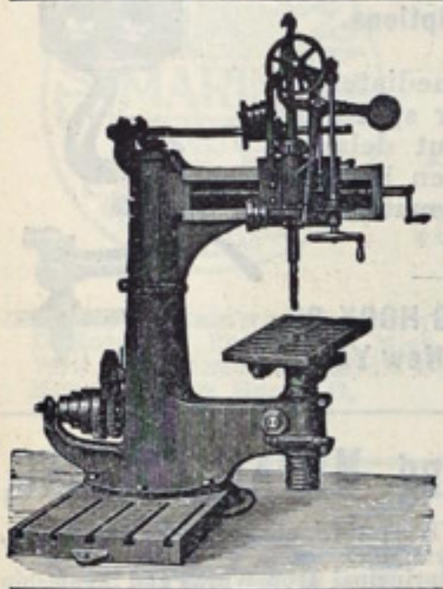

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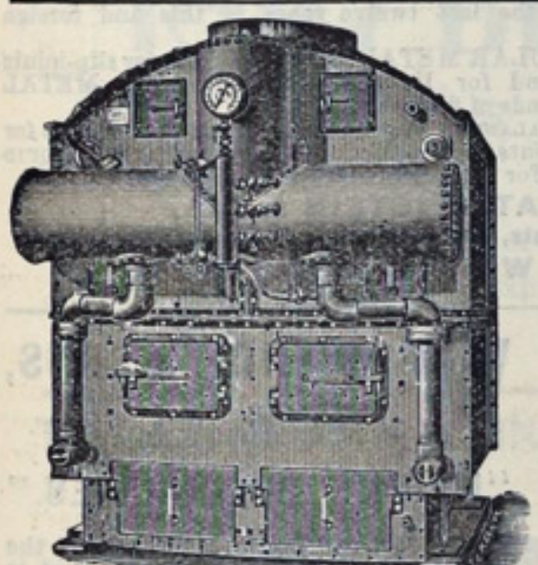

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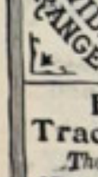

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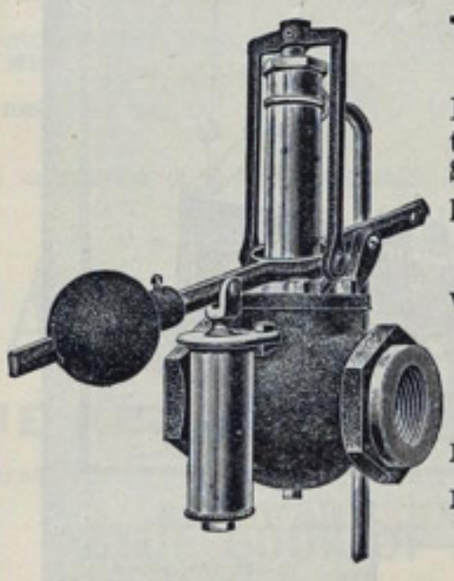

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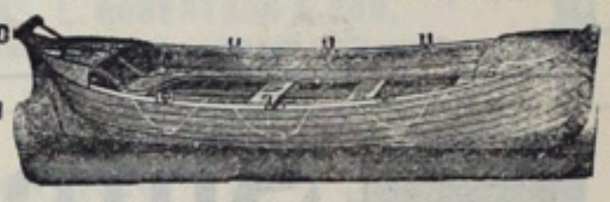

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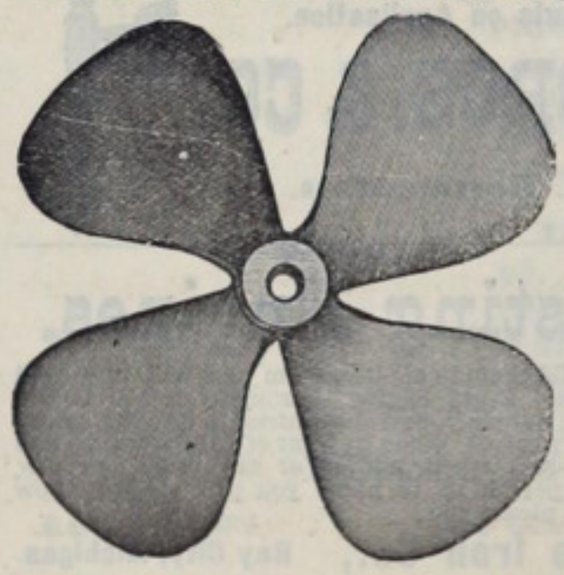

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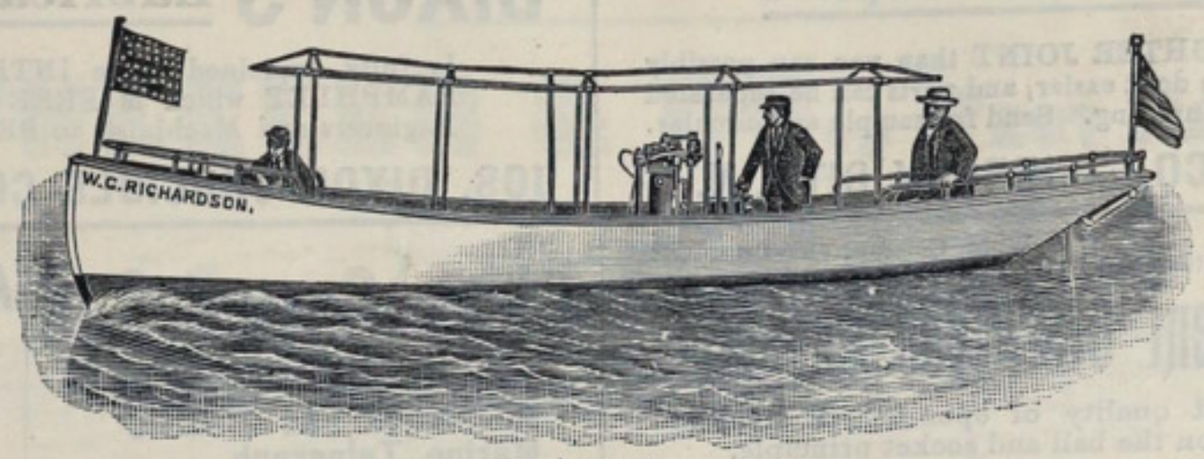

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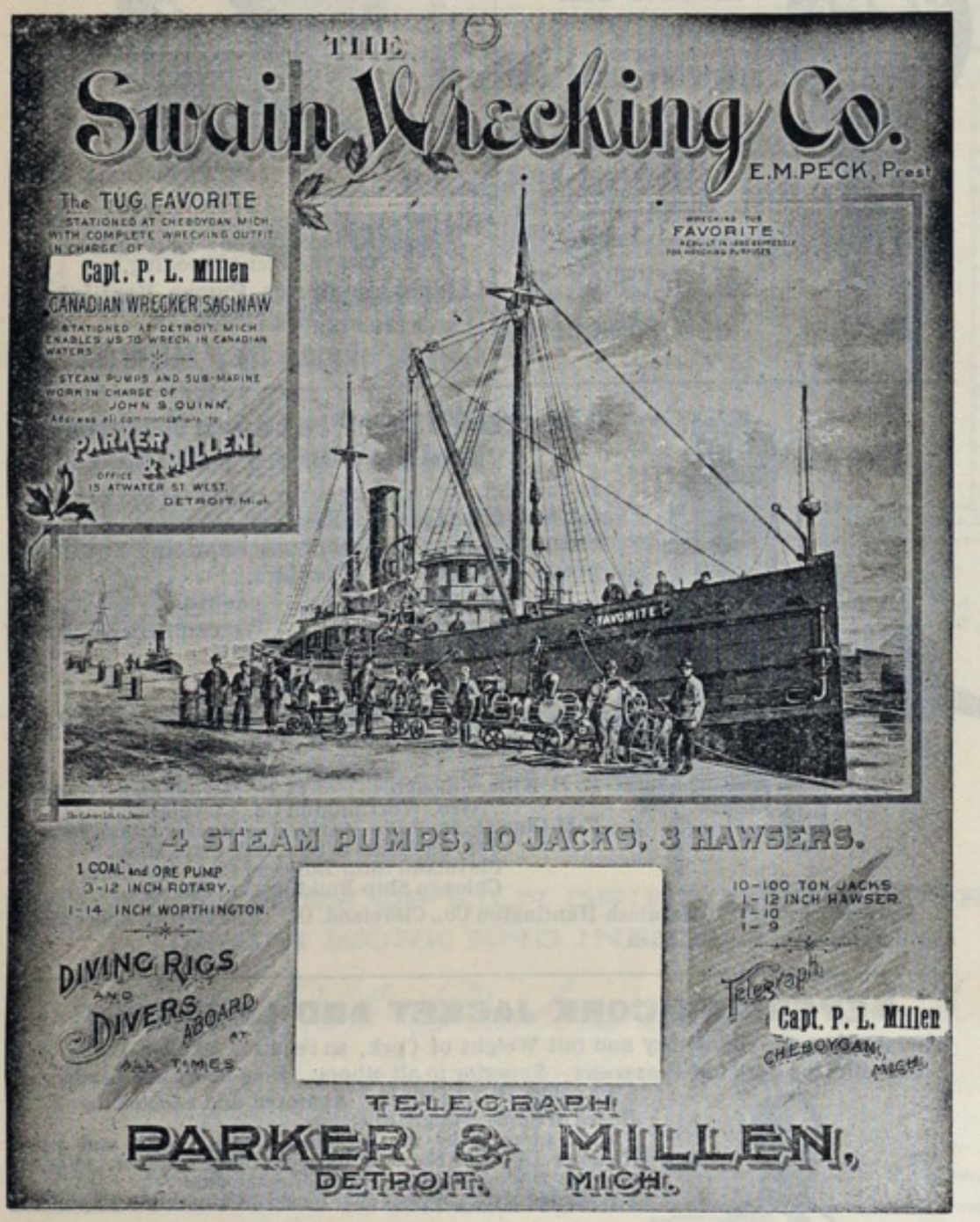

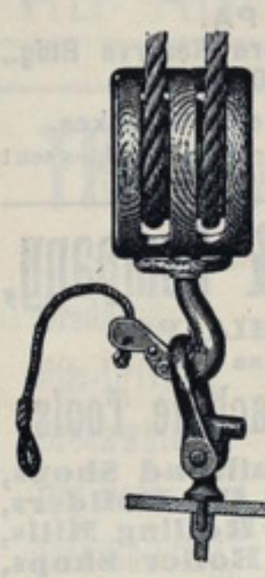

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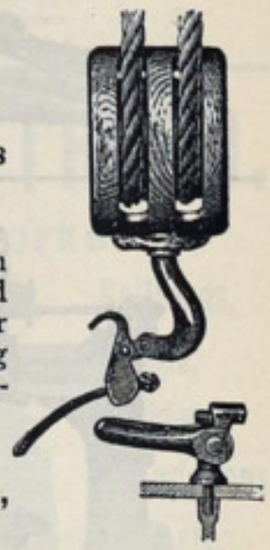

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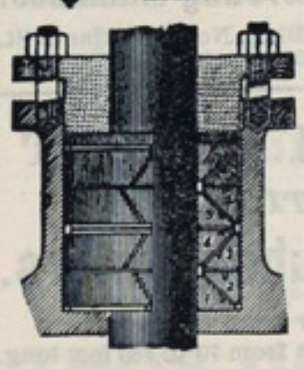

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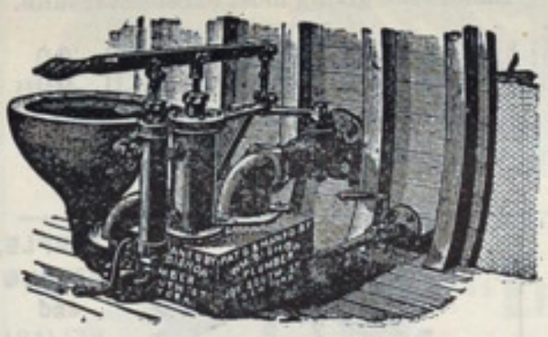

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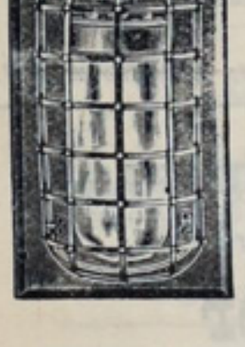

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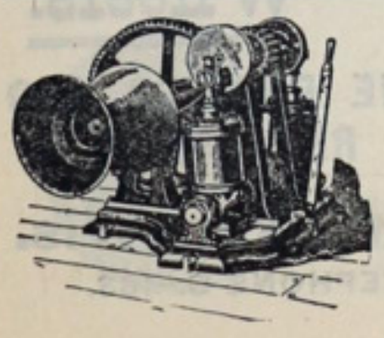

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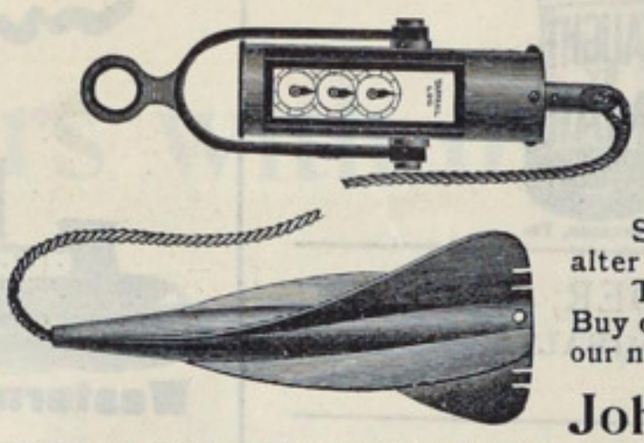

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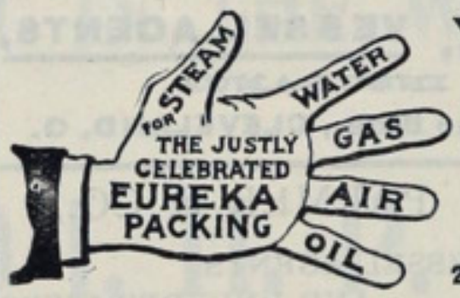

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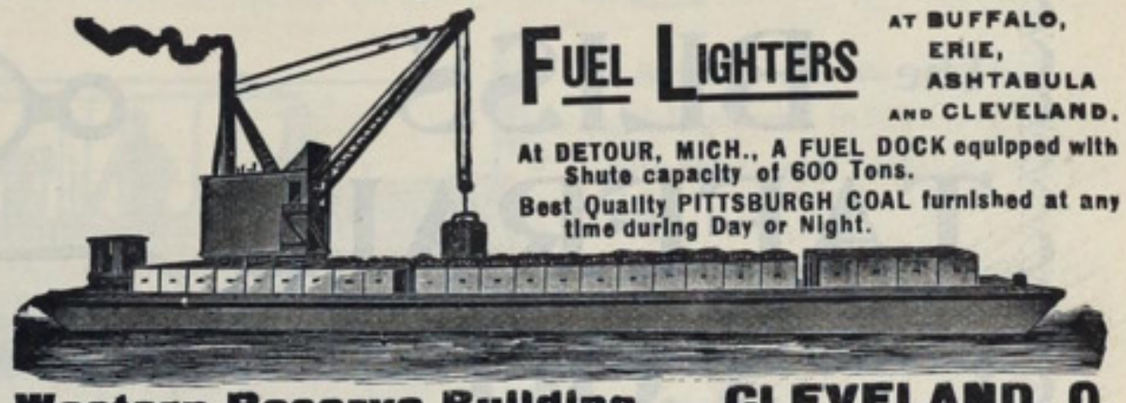

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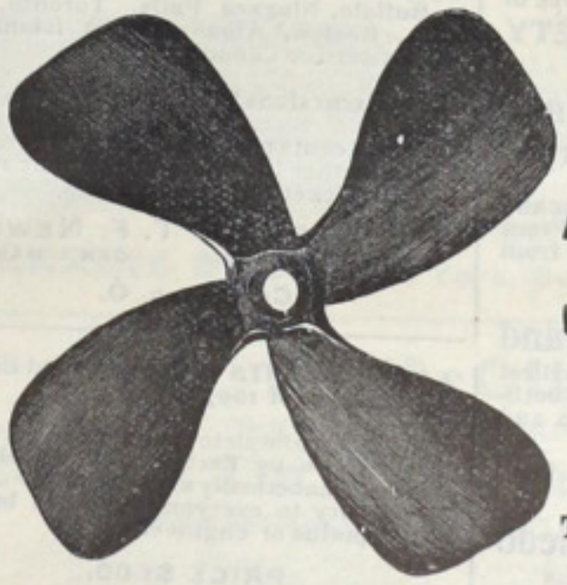

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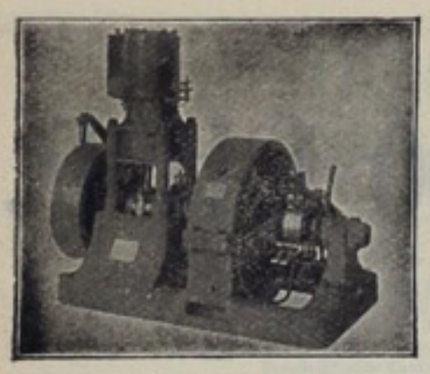

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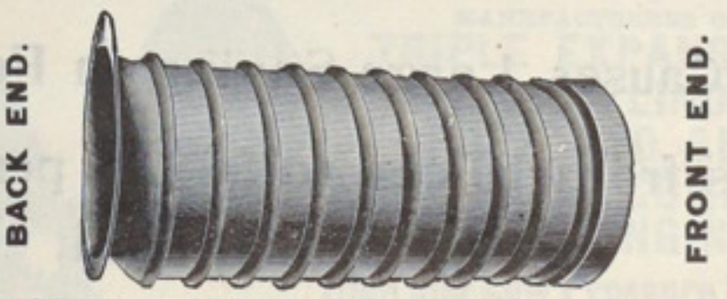

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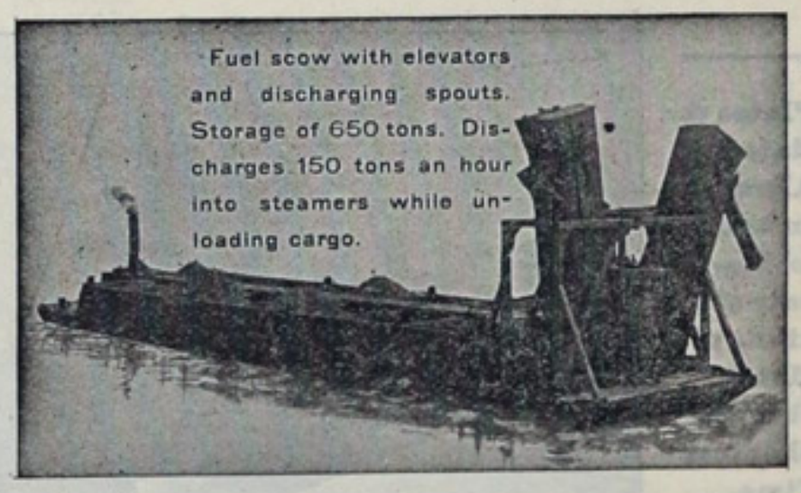
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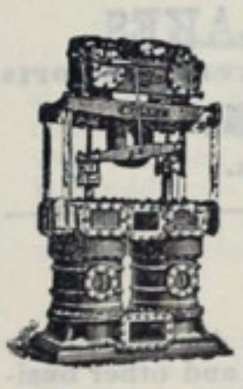

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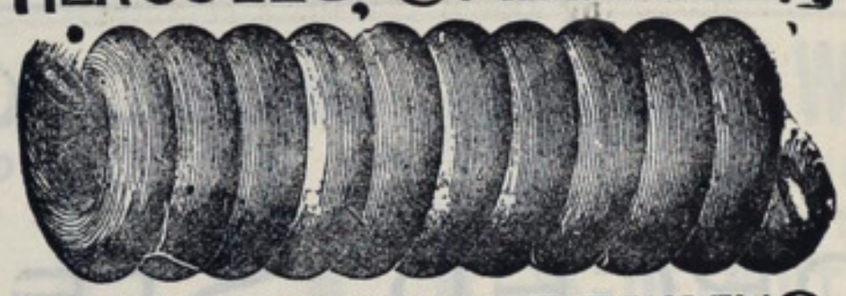

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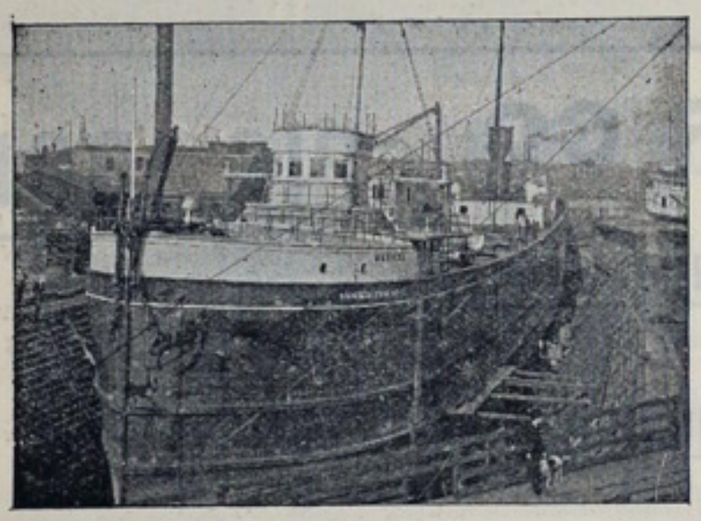

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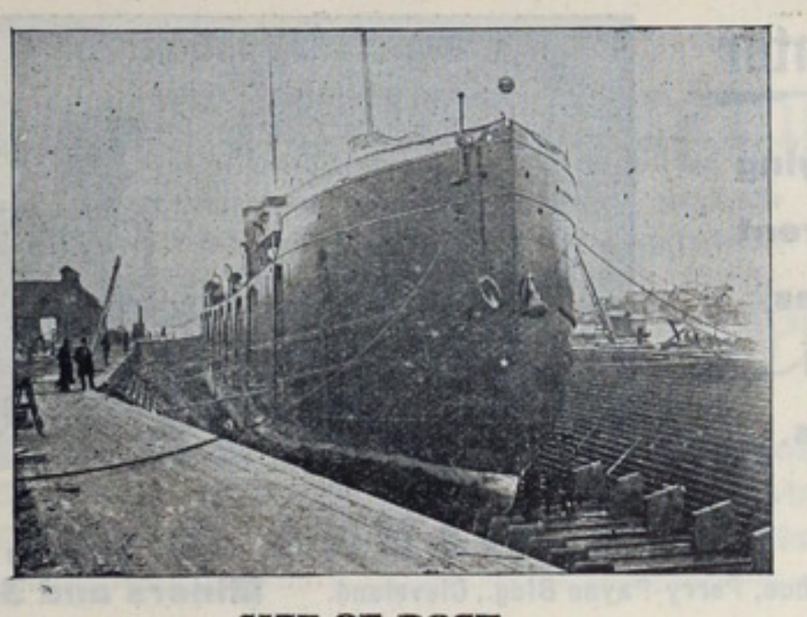

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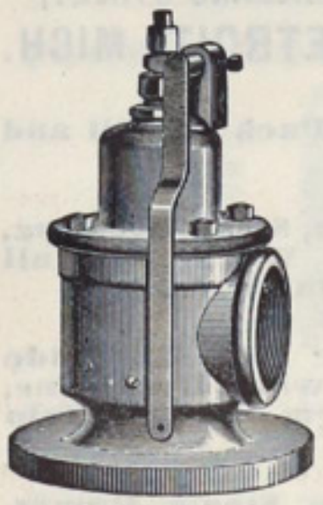

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